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INDEX

Opportunities for Group Health Instruction in Industry 1

Atmospheric Pollution 7

The Scope of Industrial Health Services from the Point of View of Industrial Medicine 12

Panel Discussion on the Selection and Training of Industrial Nurses 17

- The Need for Developing Techniques of Selection and Training 17
- The Selection of Nurses for Industry 19
- Preparation for Industrial Nursing 23
- Training Within Industry or On the Job Training 26

The Diabetic in Industry 30

The Use of BAL in Heavy Metal Poisoning 33

OPPORTUNITIES FOR *Group Health Instruction* IN INDUSTRY

By F. S. Parney, M.D.
Assistant Director of Health Services
Department of National Health and Welfare, Ottawa

The subject on which I have been asked to speak tonight is *Opportunities for Group Health Instruction in Industry.*

It will not be a very learned or highly scientific address. I shall merely try to outline a certain problem relative to industrial *and* national health as I see it — make a few suggestions, leave with you a question and then modestly withdraw, hoping that you will give the matter your serious thought, which, even if that means tearing my ideas to ribbons, will still be contributory to the eventual solution. Our problem, as I see it, is — what kind of health instruction should we, as industrial physicians, qualify ourselves to give and to what groups?

Taking as our text the World Health Organization's definition — viz., "Health is a state of complete physical, mental and social well-being, not merely the absence of disease or infirmity", and having in mind particularly the "social well-being" factor, I believe that industrial relations, which today have assumed a greater importance than ever before in the world's history, are definitely tied up with man's health and that, therefore, the industrial physician, whether he realizes it or not, has a professional responsibility in respect to industrial relations which, perhaps, may be of wider importance even than that in respect to the control of occupational diseases.

That opportunities for group instruction in this matter exist and that they are wide, deep and demanding, there can be no doubt and in my opinion these opportunities offer to the industrial physician one of the greatest and most stimulating challenges presented to the medical profession today — and we should not miss the boat!

The three groups towards which our health instruction might best be directed are:

Our own profession
Industrial management
Employee groups and their leaders

However, in order that it may bear fruit, this instruction must be presented with a technique based on understanding of the problem and faith and conviction as to the efficacy of the product we are trying to sell and *not* by the type of salesmanship which provided a certain Mr. Macpherson with an unappreciated treasure. (Story of Macpherson).

Much has been said and written, and you are all familiar with it, regarding health supervision and education in both employee and executive groups; e.g., with reference to such things as hygienic working environment, control measures against occupational diseases and general rules of personal hygiene — habits of eating, sleeping, recreation; preplacement and periodic examinations; cooperation between plant physician and personnel division on job placements and cooperation between plant and family physicians on matters involving the health of the employee or members of his family — advice re the use of public health clinics and facilities in the area, etc., etc.

Enlightened management and employees are today already sold on this kind of health education and other welfare measures but neither group is fully satisfied. As evidence of this, let me refer to some observations made by two representative industrial executives:

Mr. Henry Ford II has stated:—

> "Frankly, I think our plans for having to do with people are by far the most important though, obviously, plans for our physical plant set-up and for our people are closely related" —Again—"But meeting these needs (of our people) — really meeting them, is a ***more intangible job*** and yet it is a vitally important one" — again — "the nub of our problem is building a team of foremen, superintendents, department and division heads who realize that we can get our job done best by ***really getting along with people.***

Mr. William B. Given, Jr., President, American Brake Shoe Company, states:—

> "Today's number one concentration is the problem of company people. It is now more important to concentrate on them than on knowing customers. This human side ***seems fuller***

Presented before the Industrial Medical Conference at Quebec City, September 29, 1949.

of seemingly unsolvable problems than does sales management."

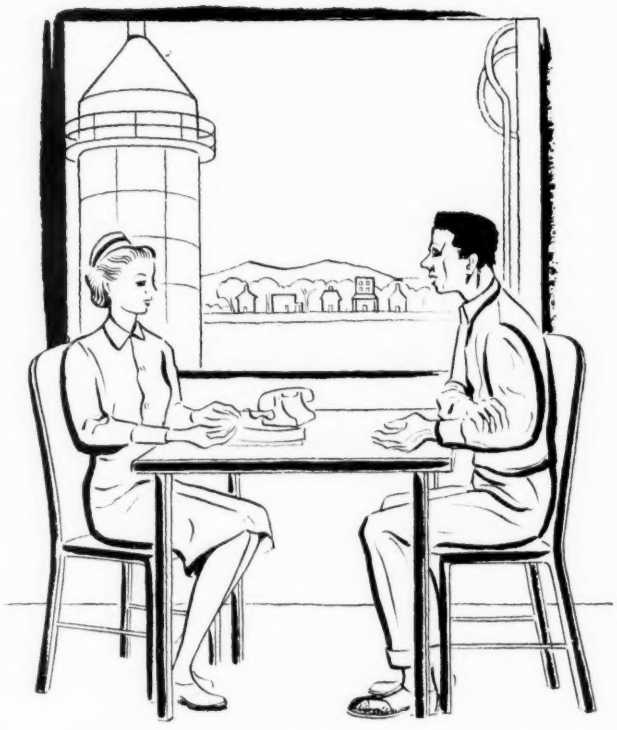
Both these executives think the number one problem in industry today is the human relations factor and they admit they do not know the answer. One describes the problem as "intangible" and the other as "containing seemingly unsolvable problems". Obviously management is groping more or less in the dark for a satisfactory solution. Mr. Given goes on to state:—

> "It is important to remind the nurse that we have no better line of communication with company families than through her. They talk with her frankly. Every opportunity she gets to help in the home makes a closer tie with our people. ***When you can help a wife or child in that home you are helping to build a better future in human relations.***" . . .
>
> "There is no greater waste of material than an able medical head in a company where the tops have the right 'patter' and the wrong hearts." . . .
>
> "The medical head should be a passionate and tireless combatant in his strife for better working conditions. He, the medical head, must feel in his soul a responsibility to every man, every woman in the company and their families. He must have real qualities of leadership and also be a damned good fighter if the hygiene department is to succeed in its objectives. As between management and workmen, he must visualize his ***responsibility*** to be that of the workers' representative at management table. He should be the kind the president takes orders from and also gets a thrill out of bucking against opposition and, incidentally, it ***is helpful if the whole organization knows just that situation.***"

If the remarks of the two gentlemen above quoted are not sufficient evidence to indicate the trend of top management thought these days all that is necessary to convince one is to read the daily papers and trade journals. Never a week goes by that some business executive does not give a similar address to some group somewhere — boards of trade, service clubs, or other gatherings.

This all boils down to the fact that industrial management today realizes that human relations within the company group are a most important factor in relation to production costs and profits — but as yet no one has come up with the know-how to permanently improve those relations.

Organized labor is also conscious of this intangible problem. Apart from the usual clauses in respect to working environment, conditions, hours, pay, complaints, etc., every new union contract today calls for more and more medical and social benefits for the



employee and even for his family, but labor, like management, is still without a real solution. However, in recent times several clear thinking labor men have independently expressed opinions containing the same nuclear or fundamental idea and it seems to me that this idea may provide the real clue in the search for a solution to the problem of human relations in industry. Here is how one man deals with this idea.

Mr. Joseph Scanlon, former C.I.O. labor leader, now lecturer at M.I.T. Boston, Massachusetts, is of the opinion that the important deterrent to the worker's happiness is fear. He named two fears — the fear of another system that will take over those things that we hold dear, and the fear of our own system — the fear that it cannot work. But the cure for fear is not pay nor any particular set of conditions. It is to be found, rather, in giving the worker ***participation in all aspects of the job and in profits, from savings brought about by the worker himself.*** The so-called "Scanlon Plan" has been applied successfully in several United States firms.

The essence of this plan is to give the workers real participation, both in suggesting and in carrying out schemes for increased efficiency, and its merit from their point of view is a new sense of usefulness and responsibility. Since he is in constant touch with the company and its problems the worker acquires also a sense of security and responsibility and when bad times come he feels ***he is being given a fighting chance which, according to Mr. Scanlon, is the main thing a worker wants.***

Mr. Given of American Brake Shoe Company also had a glimmering of the same idea but he didn't think it through to its practical application. He said:—

> "The management habit of treating every suggestion, every idea, with respect gives every man the feeling of being an important part of his department, ***gives him somthing to talk about that night at home.***"

Other people, both labor and management, have fluttered around this idea before. I think it may be the key point we have long overlooked, i.e. the "***social*** well-being" in our health definition.

Of Mr. Scanlon's idea, Dr. Theodore Green, Professor of Philosophy, Yale University, said:—

> "I am enormously impressed by Mr. Scanlon's approach. It seems to me he is talking fundamental ethics, the ethics we all believe in. What he is saying, as I see it, is that the worker isn't demanding security — he wants to escape the ***frustration of not being able to participate in the fight.*** Now that is sound economically, psychologically, philosophically, ethically and religiously — on all counts."

From all the above it is obvious that both management and labor are searching for the same goal but, so far, neither has a reliable chart by which to steer to that goal. A cartographer is, therefore, needed and it is my strong belief that herein lies the great opportunity and responsibility for the industrial physician. He, of all people, is best fitted to do the research work necessary before a navigational chart can be drawn, because of his knowledge, not only of medicine—psycho and somatic—his knowledge of human nature and man's requirements for whole health, but also his practical knowledge of industrial plants and his general knowledge of management's business problems. But he must be good! The eventual chart or plan of procedure must be practical in the light of all three factors — men, management and machines — and can be produced only by the cooperative efforts of management and labor in the light of the research findings of the industrial physician with some knowledge of sociology and with the assistance of the sociologist.

Generally speaking, industrial relations throughout the world today do not reflect any great degree of happiness. There is an old saying "The ***happy*** ship is likely to be the more ***healthy*** and efficient one". Having in mind our definition of health, I wonder if a new version should not read "The ***healthy*** ship is likely to be the more ***happy*** and efficient one".

We have long been used to dealing with the physical and, to some extent, the mental unwell-being of man but only in recent times have we realized that when appraising his state of health the whole man, including his emotional side, must be taken into account at one and the same time. Emotional pathology can be very serious and usually results from "***social*** unwell-being".

Touching this emotional side of the industrial worker, let me quote Dr. Cary McCord who has spent a lifetime working for and among industrial workers and who is an internationally recognized authority on industrial hygiene. But perhaps his deep understanding of the emotional side of the human machine is not so widely known:—

> "Those who fatuously believe that all workers have been shorn of half their nerves of sensation need to have the scales beaten off their own minds. These same silly ones likewise may believe that the mental and emotional equipment of industrial workers is irresponsive to the shocks, stresses and strains that bring about the quirks and kinks in the affairs of these self-styled "superior" beings. (It may be true that only the elite may afford to indulge in the luxury of psychoanalysis and face a two thousand dollar bill for this service). But in spite of the saving grace of long hours of toil, a high percentage of workers everywhere are handicapped by a world of neuroses —their own and those of their fellows.
>
> The industrial worker is highly vulnerable to the buffeting in his world. Like most of the rest of us he is beset by uncertainties, anxieties, insecurity, inferiority complexes, phobias, neuroses, fear of not fitting into his group, fear that he may be disliked, a little insecure as to his job, uncertain about the attitude of his foreman toward him, disturbed by troubles at home, a complaining wife, demanding children. His work world may be filled with noise, monotony, fatigue.
>
> For many, shortened hours of labor, however gladly accepted, only add to the burden of the worker's living. Scant opportunity for recreation, unattractive homes, few friends, limited satisfaction. Deeply hidden in the average workman are lonesomeness and anxiety."

According to our definition of health, such a man is unwell. Over a period of time the condition described above is likely to become as disabling as lead poisoning or silicosis and, although not compensable, can be economically just as expensive because of lost time and wages, accident proneness, spoiled material or lessened production and general unrest ***and the latter is contagious in a plant or group.***

I have done a lot of quoting but I have used the findings and opinions of experienced authorities to help us visualize the first part of our problem. What kind of health instruction is needed?

We recognize today that a man cannot be wholly healthy when he is suffering from fear or frustration, and frustrated he will be if he gets no personal satisfaction out of his work or is prevented from carrying that degree of responsibility of which he is capable within his working group and *fearful* he will be if he lacks security, either material or social or both.

This we have learned from the psychiatrist. Today, every day in his work, whether he realizes it or not the industrial physician puts into practice the fundamental, elementary principles of psychiatry—psychiatry is becoming accepted and established in industrial medicine just as it is in the better practice of medicine anywhere. But even so we still have not yet covered the third part of man's whole health, i.e. his *social* well-being.

Man has inhabited this earth for several thousands of years but only during the last one hundred years or so has he in any numbers left the soil from which he obtained security, and even some serenity, to live cheek by jowl with strangers in the crowded city with its stresses, strains, insecurity and machines. Machines, which were at first intended to be man's servant, have been developed so rapidly they have become his master. These machines are hungry and demand that they be fed on raw materials from all over the world. The production and shipping of these raw materials to the machines, the building of new machines, the operation of the machines and the distribution of the manufactured products have created a demand for mass labor — labor paid for in wages which represent the workers' only source of material security. In the past the demand for this labor, and with it the worker's material security, have fluctuated greatly while he himself has been completely powerless to stabilize his condition.

Furthermore, through high powered salesmanship, such manufactured goods and services as electric power and equipment for transportation, light, heat, cooking, refrigeration and labor-saving devices of all kinds, together with telephones, television, radios, movies, automobiles and air travel, etc., etc., etc. have become standard equipment in a new standard of living. All these so-called advances have occurred during the last 50 years. These new items are now more common than was eau de Cologne in the gay nineties.

This accelerated tempo in the development of civilization (and heart disease) has been tremendous; consequently there has developed a rapid world-wide economic and social evolution or upheaval. History tells us that social evolutions or upheavals in the past have always been accompanied by varying degrees of chaos and have messed up human relations even to the extent of causing class or religious wars and largely because *man has always been slow to adapt himself mentally and socially to new conditions.* He has always *resisted change;* so too has our own profession. We are too apt to fall back with complacency on our achievements in the field of physical cures. It is only in very recent times that we have realized the importance of mental health and that it also is our responsibility.

The present social evolution has been gaining momentum over the past 50 years and the resulting chaos has been aggravated by two world wars.

During this present upheaval man's social unwell-being has been increasing and naturally it has been more evident among large groups herded together in crowded centers of population than among those who have remained close to the soil. I suggest to you that herein is the underlying fundamental cause of unhappiness and unrest among industrial workers today and that even ideal working conditions, adequate wages and free pensions do not in themselves constitute the complete answer to the human relations problem in industry.

In the course of one year the average industrial worker lives about four-fifths of the year's total hours outside his working environment and it is only logical to assume that what he does, thinks and feels during four-fifths of his time will shape his attitude towards the remaining fifth, but up to date we have given little thought to the significance of this four-fifths factor.

Sociologists and anthropologists have long been studying the actions and reactions of man as a social animal and have acquired much knowledge in the matter. They have already told us that man's social well-being depends on three fundamental needs; viz.—

1. Security, material and physical.
2. To be a person; personal freedom and equal justice.
3. Social security — that is, to belong to an informal group of fellow workers which has some importance, significance and stability in the community and which supplies his need of a sense of human dignity and to have the opportunity to battle with his own head and hands, at least to some extent, for his material security and not be utterly dependent for security on conditions over which he has no control, e.g., fluctuations in trade, faulty or uneconomical production, poor management or the whims of boss or foreman.

These three fundamental requirements can be likened to the legs of a three-legged stool. As long as three legs are all the proper length the stool remains balanced and stable. Cut a portion off one leg and the stool becomes wobbly — adding a bit to one of the other legs will not re-establish stability. For example, if in an industrial group wages are too low in the economic picture of the day, offering the worker more social and recreational facilities is not going to help the situation, or, if in the presence of adequate wages, the individual's personality is being smothered or his human dignity offended increased wages will not make him happy for more than a limited time after which, in all probability, he will again strike for higher wages in the vain search for his subconscious missing need. Therefore, the most important factor in respect to the wobbly stool is an accurate diagnosis as to which leg is the short one. As in other pathological conditions the necessity for correct diagnosis is only equalled by the necessity for an early diagnosis.

In these hectic, uncertain times, stools are wobbling all over the lot — short first on one leg and then another. Sometimes a whole group is short on the same leg, maybe due to faulty supervision or to an unexplained change in company policy, work or procedure. Sometimes two neighboring groups in the same plant may be short on different legs — and always there will be different legs short among individuals of the same group because there was a piece of leg cut off in that part of his life *outside* the plant environment altogether — but the individual must bring his wobbly stool to work with him. This is likely to affect his work, his relationships at work and his accident proneness. He is unhappy. He may not realize which stool leg is short but his unhappiness will inevitably affect his group and perhaps affect the relations of the whole group with the foreman. All this will happen under the eyes of the industrial physician.

Who then is best fitted to determine which leg is short? I believe it is the industrial physician with his professional training, his knowledge of men, management and machines. Being neutral, yet knowing the problems, viewpoints and personalities, as well as having the confidence of workers, supervisors and management, he is in the most advantageous position to know all the pertinent facts and conditions necessary to make the correct diagnoses as to which is the short leg and also to do the *research* necessary to determine primary causes of the leg shortage.

Added to the knowledge of the basic principles of sociology the qualities required by the industrial physician in this research job are personality, patience and pride.

Personality, which we often speak of as being possessed by an individual and very often in this connection use the phrase, "He has personality-plus", is not a *static* quality but a *fluid* one and really is the individual's ability to *adjust* his personality quickly and congenially to that of the other fellow and must include an innate and sincere interest in human beings.

Patience — in dealing with an individual who is in a disturbed emotional state it is essential to give generously both of time and interest and to be prepared to let the patient tell his own story in his own way before asking questions. Revealing diagnostic answers to probing questions will only come after the patient has consciously or unconsciously decided that the doctor not only can be trusted with the most intimate confidences but above all is *understanding.* Hundreds of industrial physicians have asked, "When do you think I have time to put my feet on the desk and listen to a chap bellyache for an hour?" The

reply to that is "You'll be wise to find the time". That hour is a jolly good investment, is a time-saver, not a time-waster for, if it is not invested the same patient will take up many, many hours over a period of time and the chances are that the net result from the physician's, the patient's and company's standpoints will not be as good as it would have been had the doctor tackled the problem in its early stages.

Pride will come in "pride of achievement" for if *in the research laboratory of his daily work* the physician can discover the fundamental cause of *social* "unwell-being" in the individual and the groups among whom he is working the treatment required will be self-evident, even if perhaps difficult to institute. However, here will come the industrial physician's opportunity and *material* for vital health instruction to employee and management groups and to the profession by pooling his findings and experiences with other physicians at such conferences as this or by other effective means.

Having such an objective to each day's work would not only assist the physician in keeping his own stool balanced but would, over a period of time, permit him to reap richly of the reward that is part of the profession's tradition — viz. satisfaction in contributing to human welfare and happiness within his own sphere of activity and, by influence and example, he might well contribute greatly to betterment of human relations in an ever-widening field.

Here then is the question I leave with you for serious thought:

As industrial physicians should we not acquaint ourselves with the basic principles of sociology and learn how to apply them in a practical way in our special field as we have done with the elementary principles of psychiatry and psychology?

Is this not necessary to fully qualify us to meet our responsibilities, viz. the supervision of health in industry — physical, mental and social?

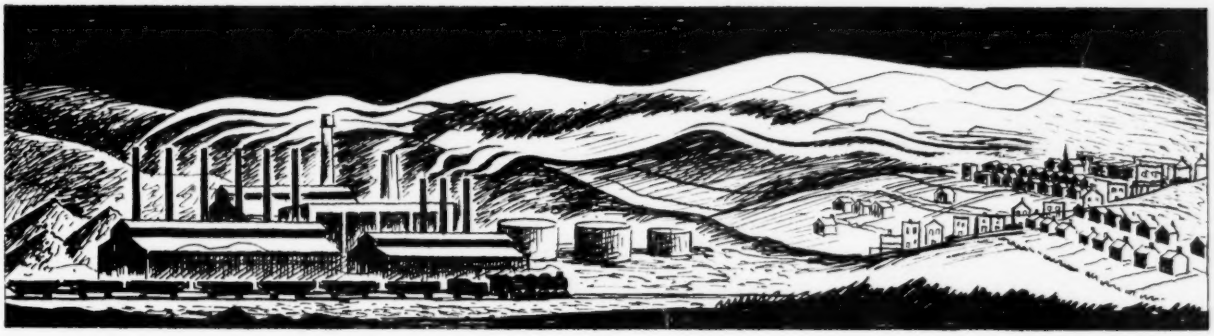
Editor's Note—

In connection with the foregoing article by Dr. F. S. Parney, readers will be interested in the following news item which appeared in ***Health on the Job,*** January, 1949, published by The Institute of Industrial Medicine, New York University — Bellevue Medical Center, under the title—

MEDICAL DEPARTMENT TAKES OVER HUMAN RELATIONS PROBLEMS

"On the basis that the traditionally confidential doctor-patient relationship will prove more effective in solving intimate personal employe problems not connected with jobs, the Socony-Vacuum Oil Company, Inc., has transferred administration of human relations activities from its industrial relations department to its medical department, the New York Times said recently:

> "Dr. A. E. Hoag, medical director, said that employe productivity is curtailed considerably by problems encountered outside the work environment and added that management is anxious to aid in their solution. Many employes, however, will not reveal to industrial relations executives the nature of a number of problems adversely affecting their work because they feel they will become generally known throughout the organization, he continued."



Reprint from The Industrial Hygiene Newsletter, Volume 9, Number 10.

Atmospheric Pollution

By Dr. J. G. Townsend, Chief
Division of Industrial Hygiene
U.S. Public Health Service, Washington 25, D.C.

Dr. J. G. Townsend, Chief, Division of Industrial Hygiene, Public Health Service, spoke at the Industrial Hygiene Section of the West Virginia Public Health Association on "Atmospheric Pollution". Exerpts from his speech follow:

History

IN speaking of atmospheric pollution, we must remember that it embodies two concepts. One is smoke and the other is dusts, fumes, vapors, mists and other contaminants that are emitted by industrial plants. The smoke aspect of the problem was recognized first. For, as Sir Napier Shaw and John Switzer Owens tell us in their book, *The Smoke Problems of Great Cities*, the smoke nuisance made itself felt just as soon as the use of coal became general. Way back in 1257 Eleanor, the Queen of Henry the Third, was reputed to have left the town of Nottingham because she was bothered by the smoke of sea coals. In London, sea coal was considered harmful to health and in 1273 its use was prohibited.

"Despite these and other efforts, however, the use of coal by brewers, dyers and others who used much fuel increased in London. The nobility and other dignitaries going to London to attend Parliament were annoyed so much at the increasing smoke that they led the people in demonstrations against this obnoxious fuel. Finally a royal proclamation was issued in 1306 and was implemented in 1307 by the appointment of a Commission of Oyer and Terminer. This commission was given instructions 'to inquire of all such who burnt sea coal in the city, or parts adjoining, and to punish them for the first offense with great fines and ransoms and upon the second offense to demolish their furnaces.' The king apparently meant what he had said, for one man who was caught burning sea coal in London was tried, condemned to death and executed.

"These were the forerunners of modern efforts to abate the smoke nuisance. After the passage of several more acts England has carried on systematic studies on atmospheric pollution since 1914.

"In the United States the Mellon Institute of Pittsburgh, Pa., carried on the first elaborate study of all phases of the smoke problem from 1911 to 1914. The psychological, economic, meteorological, botanical, engineering and health aspects of the problem were considered. The results of this investigation still serve as a significant source of information on the subject. We learned that smoke pollution can be costly from several standpoints. For example, one of the investigators estimated that in 1913 the smoke cost the people of Pittsburg about $10,000,000 a year. Another investigator found that the presence of smoke or fog reduced the chemical action of daylight by 25%. A group of physicians also attempted to find a relation between smoke and health. While practically all of them agreed that smoke helped to increase the severity of, and mortality from acute diseases of the air passages, their opinions were divided as to the effects of smoke upon tuberculosis.

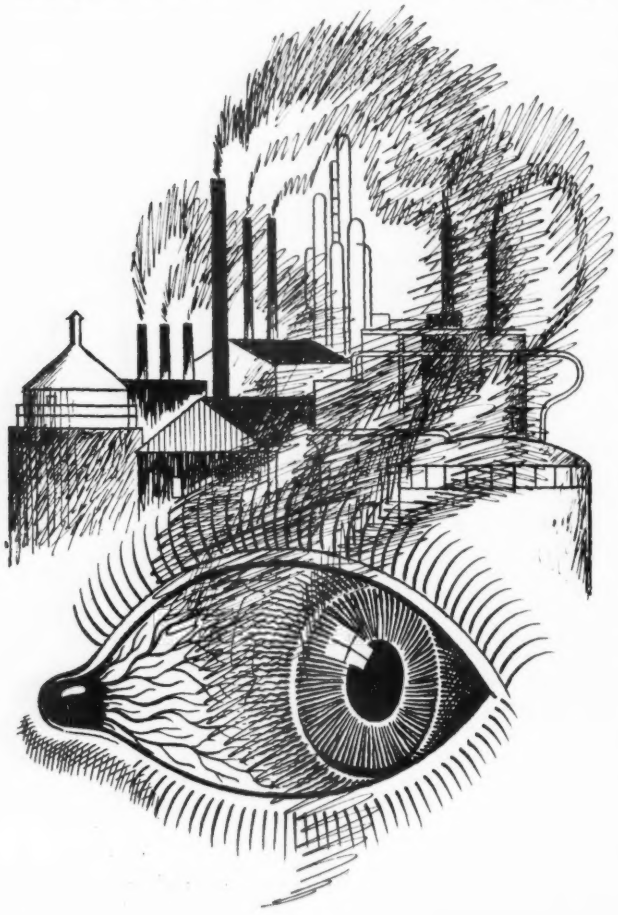
"Other studies followed in the wake of the Mellon Institute's investigation. The period 1926 to 1929 found studies conducted in Baltimore, Washington, Pittsburgh, New York, Boston, Cleveland, Columbus and probably other cities. Then in 1931 to 1933 the United States Public Health Service undertook a survey of 14 of the largest cities in the United States. For several years there was a lull in activity until St. Louis inaugurated its smoke-control program in 1939-40. Interest in air

pollution waned when we got into the war but since then it has reached an all-time high.

"The smoke phase of the air pollution problem can be solved by comparatively simple smoke abatement regulations. Such regulations are now in effect in Cleveland, Pittsburg, Detroit and Cincinnati, among other cities. The reduction of smoke resolves itself into using only nonvolatile or low volatile fuels — or burning any type of fuel in a specially constructed furnace. In large installations special equipment may be set up for the collection of fly ash before it is sent out into the atmosphere. These procedures would work equally well in any city where *smoke* is the main problem. But when it comes to controlling industrial emissions — fumes, vapors, mists and dusts from industrial operations — we find that there is no blanket solution.

Los Angeles Smog

"In Los Angeles, for example, smoke abatement regulations would not work, for the city burns oil and gas instead of coal. Yet there is a problem, as any native who has suffered severe and disagreeable eye irritation will tell you. The Los Angeles smog is due to the combination of contaminants with the haze or mist peculiar to that area to form a dense, smoky atmosphere. It results in a sharp reduction in visibility and sometimes also affects the nose and throat as well as the eyes.



"According to recent reports the Los Angeles basin experiences smog of the type which irritates the eyes severely 10 or 20 times a year. These attacks last four hours or less and occur most frequently in the late morning hours of the summer and autumn months. Threshold smog conditions occur with greater frequency. Although there are no records concerning this effect of smog in past years, longtime residents of that area say that it dates as far back as 1912. However, they believe that the frequency of the smog and the severity of its eye-irritating effects have increased markedly in recent years. Since there has also been a notable increase in the pollution and industrialization of Los Angeles County in that period, we may assume that the greater quantity of contaminants exhausted into the air may be responsible for this situation.

"The Stanford Research Institute, which is privately investigating the smog problem in Los Angeles, reports that the nature of the substances in smog that cause the eye irritation is not yet known. Improved ways have been devised to collect and identify the particles that compose smog and to determine under laboratory conditions the eye-irritating properties of these substances. Through this continuous work there is hope that the answer may be found. It appears, however, that the peculiar meteorology of the Los Angeles area is decisive in controlling the time and duration of eye-irritating smog. Because of the complexity of the problem county officials have set up a special air pollution control agency to cope with it. This office works closely with the industrial hygiene division in Los Angeles.

Other Studies

"There have been air-pollution studies in other areas, too, principally by state industrial hygiene offices. You in West Virginia are familiar with the soot-fall study of two years' duration in the Charleston area which has just been completed. Another study is under way in a Utah town of 20,000 to study the effects on the health of the community of sulfur dioxide discharged into the air by smelters.

"The number of industries polluting the atmosphere is legion. Among those investigated are lead smelters, metal reclamation plants, chemical plants, talc mills, stone-crushing mills, paper mills, rendering and fertilizer plants and varnish cookers.

"An unusual instance occurred in a neighboring state where the industrial hygiene division assisted in the abatement of a neighborhood dust-pollution problem created by the peanut industries. In harvesting the peanut crop most companies use pneumatic unloaders. These as a rule are not constructed to handle

finely divided dust. As a result the dust is discharged into the atmosphere and everyone in the vicinity breathes it. A sample of the settled dust in this particular town showed a silica content of approximately 50%, indicating that large numbers were exposed to high silica dust.

Many Implications

"This example illustrates the ramifications of air pollution as well as possible health implications. I should like to emphasize that, unlike smoke abatement, the control of industrial contaminations may require as many solutions as there are plants in a given area. To cite another instance — in certain localities around aluminum plants there has been difficulty with grass contamination by fluorine supposedly emanating from the plants. There have also been alleged deaths near beryllium plants. All these are individual problems and must be dealt with separately.

"The problem is further complicated by the lack of sufficient knowledge. We do not have rigid criteria to determine when industrial contaminants are harmful to the general population. Their effects on vegetation cannot always be a guide because physiological effects on plants may be produced by extremely small concentrations of gases and vapors.

"The effects of injurious atmospheric contaminants on human beings are of an acute or chronic type. Acute conditions are induced by direct toxic action. Depending upon the concentrations of the contaminant in the air, individuals of various ages and stages of health may be made ill. Usually there has to be a markedly dangerous degree of contamination before a young person who is enjoying good health is seriously affected. Aged persons, however, and persons with impaired health are more susceptible. Likewise allergic or hypersusceptible individuals are liable to have trouble.

"Chronic ailments due to air pollution may also be caused by direct toxic action. Susceptible persons who constantly breathe contaminated air experience such difficulty. Contaminants may also play an indirect role in chronic disorders. They reduce vitality. They may weaken resistance to certain common diseases and lessen chances of recovery. This is particularly true of respiratory diseases. By shutting out a large percentage of the health-giving, germicidal rays of the sun, air contaminants allow disease-producing bacteria to grow unchecked. Ultraviolet rays are kept out, too. These rays are important to human life. For example, through the action of ultraviolet rays on certain substances of the body the proper amount of calcium and phosphorus is deposited in the bones and teeth. Thus one of the influences of these rays is the cure and prevention of rickets in children. Air pollution creates a layer of smoke which keeps out these rays to a great extent. These effects, obviously, are anything but wholesome.

What Is Health?

"Our definition of health will also influence our interpretation of so-called harmful effects. The World Health Organization has defined health as a state of complete physical, mental and social well-being. It is not merely the absence of disease or infirmity. If we accept that concept, then we must concern ourselves with the nuisance contaminants that are annoying or disagreeable to people . . . and that cause bad psychological reactions. Lacrimation and irritation of the nasal passages are certainly not conducive to a feeling of buoyancy and exuberance. Nor does waking up in the morning to a smoggy day instead of sunlight encourage a glad-to-be-alive feeling.

"In its report on air pollution the Mellon Institute has this to say: 'Heavy black clouds and fogs may often strike fear and terror into children or may make them feel depressed and gloomy or restless. Some children experience "terrible fear" at times and others feel that "something dreadful will happen when the horrible black clouds appear." Dark days exert a particularly sinister influence upon working people. One factory head has ventured the opinion that a disagreeable day yields about 10% less labor returns than an agreeable day.' So we see that morale and other factors enter into the picture. Each industrial town must make its own decision as to their relative significance.

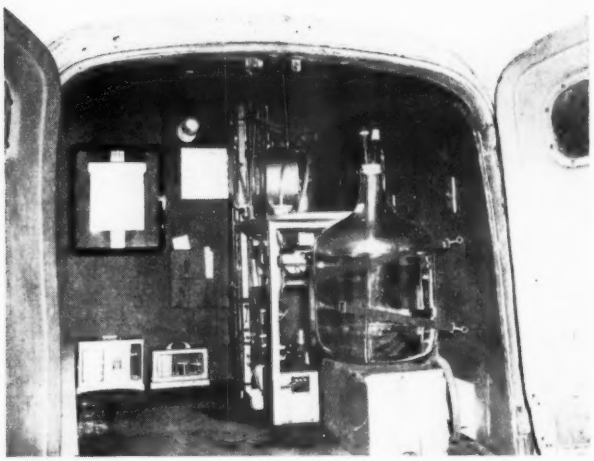
"Having first considered our own health we must then determine what importance to attach to animal life and to vegetation. Animals can be affected in two ways. They may suffer direct toxic action by inhaling a poisonous contaminant. Or they may come in indirect contact with the contaminant by eating contaminated vegetation.

"Because of air pollution by industrial plants many communities are barren of vegetation, resembling lunar landscapes. No vegetation means no crops and gardens. The lack of parks, trees and flower gardens detracts from civic beauty as well as recreation.

"There are economic considerations, too. Air pollution forces people to move to suburbs, resulting in falling real estate values in industrial towns. Because of air pollution, buildings are soiled and discolored. Corrosion eats away at stone, mortar and metals. The interiors of buildings are also subject to soiling and corrosive action on walls, rugs, draperies, linens and clothes. Replacements must be made frequently. Soap, laundry and dry-cleaning bills are increased, adding to the household living costs. In stores there is a loss of merchandise. Polluted atmospheres cut down the normal amount of sunlight. More artificial lighting is needed, thus increasing the cost of illumination.

Research

"All in all, air pollution presents a challenge. Fundamental knowledge is available on which to base control procedures. But much more work is needed to develop practical and economical methods that can be utilized by industry. The type of control, of course, will depend on the nature of the contaminant. In general, contaminants fall into two classes: particulate matter, and gases and vapors. In particulate matter we find metallic oxides, sulfur trioxide, siliceous material and other dusts, fumes, mists and fogs. Then there are the carbon, tar, fly ash and other elements of smoke. Of the gases and vapors, the more common ones are sulfur dioxide, carbon monoxide and dioxide, hydrogen



Shown above is a mobile laboratory used to facilitate engineering research—U.S.P.H.S. Photo.

sulfide, oxides of nitrogen, hydrofluoric acid, hydrochloric acid, ammonia and organic solvents.

"The sources of these contaminants are many. Smoke is created wherever there is incomplete combustion — in plants, trains, boats, homes, incinerators, brush fires and so on. Motor vehicles exhaust pollutants into the air. Industrial plants emit virtually all types of contaminants.

"Through the use of sootfall measures, impingers, filters, electrostatic precipitators and other equipment, samples of these contaminants can be collected, measured and analyzed. Once their source and concentration are known, steps can be taken to cope with them.

Relief Measures

"Gases and vapors, for example, may be diluted by being emitted from high stacks. That is the reason why many industrial plants have huge smoke stacks that tower into the sky. When the contaminant is discharged into the atmosphere at that height it is already a considerable distance from the ground. Then it can be caught up by winds and lifted higher into the atmosphere. If nature provided us with enough wind and turbulence for mixing and diluting contaminants we would not have an atmospheric pollution problem.

"Removal of gases and vapors may also be effected by collection. A variety of engineering and chemical methods may be used including scrubbing, which removes acid contaminants. Or the gases and vapors may be removed by transforming them into less harmful substances. This may be accomplished by combustion. A pollutant which has an odor, for instance, may be run through the furnace to burn it into less obnoxious material.

"Particulate matter also lends itself to control by dilution and further combustion. It may be collected by centrifugal action and impingement, wetting, or through the use of filters or electrostatic precipitation. Even the comparatively new development of ultrasonics is being harnessed to collect particulate matter.

Meteorology

"How well these methods work — and which one is preferable — depends upon another factor — meteorology. Two given localities may have the same types of industrial plants and other sources of contamination. Thus they may have the same kind and degree of contamination. But the severity of their air pollution problems may differ markedly. If one community enjoys good convection, the turbulence caused by wind currents will dissipate the contaminant. If frequent

mist or haze prevails, such as in the Los Angeles basin, the problem is more serious.

"When unique meteorological conditions combine with fog and man-made contaminants they can form an ill-fated triangle. This was recently illustrated in the Donora incident which was the object of an intensive investigation by the Division of Industrial Hygiene of the Public Health Service.

Varied Solutions

"As I mentioned earlier there are several ways in which air pollution can be reduced. Production does not have a monopoly on ingenuity. American industry is finding that it can devise different ways — to suit its own particular operations — to reduce the contaminants that it discharges into the atmosphere as well.

"A smelter works, for example, was faced with the problem of reducing the amount of sulfur dioxide that it emitted from its stacks. One solution was to convert it into sulfuric acid, but the plant found that it would have more sulfuric acid on its hands than it could handle. Finally, a practical way was hit upon that combined two methods — transformation and dilution. The company studies meteorological conditions and, when there is enough air turbulence to dilute and disperse the fumes, the sulfur dioxide is emitted through two stacks. When conditions are not favorable for dilution the sulfur dioxide is converted into sulfuric acid. In this manner the plant is able to get some use out of the sulfuric acid and isn't caught with an unwieldy amount.

"Plants contemplating new construction are even going one step further. Just as they have built safety features into machinery, they are designing plants to control contaminants that would normally pollute the atmosphere. The selection of a plant site is also now being made with an eye to meteorological conditions. Previously such factors as proximity to water and other sources of transportation were considered in selecting an appropriate locality. Now there is a trend to also include a study of general weather conditions in the area before a decision is made.

"These are healthy indications. They do not mean that the problem has been solved yet. But we are making good headway. The Donora disaster may well serve as a guiding light — reminding us of our responsibility and leading us on to a solution. Much work has already been done in this field. We need only to pool and intensify our efforts. The situation can be corrected only through an enlightened, understanding desire on the part of the public to take the necessary steps.

THE SCOPE OF *Industrial Health Services* from the point of view of industrial medicine

By R. G. Birrell, M.D., Medical Director
Imperial Oil Limited, Toronto

In *The Canadian Medical Association Journal* for September, 1949, there appears a talk by J. A. Chambers, vice-president and general manager of George Weston, Ltd., entitled *An Executive's View of Industrial Medicine.*

Mr. Chambers says:

". . . . industrial medicine was never looked upon by the management of our company as just another department of social welfare. It was assessed as a sound economic investment in the general health, efficiency and well-being of all concerned.

The management of our group of companies is completely 'sold' on industrial medicine as a sound economic investment. We know that it is impossible to assess all the benefits derived from its application but it is manifest to us that healthy minds and bodies produce clear thinking, alert physical activity and mental happiness. These three, when brought into play by the individual, produce better workmanship, better quality of product and, on the whole, a healthier social fabric. This, in the opinion of our company, is the goal we should all set our hands to."

Basically an industrial health program will consist of:

1. Preplacement medical examinations
2. Confidential records
3. First aid for the sick or injured
4. Rehabilitation of the sick or injured
5. Health education
6. Sanitation
7. Industrial hygiene
8. Reports—of department activities, including statistics on absenteeism due to sickness or injury
9. Periodic medical examinations
   a) compulsory—where toxic or hazardous employment occurs
   b) voluntary
10. Adequate medical care in isolated regions

In order that an industrial health program may function efficiently the medical director should:

1. Report directly to top management
2. Coordinate medical department activities—
   a) with those of other company departments
   b) with those of government and community health organizations

The scope of industrial health services as practised by some of the larger industries in Canada and the United States varies a great deal according to the basic plan as set forth in their individual programs and with the interpretation of those plans both by management and the medical departments. It should be basically the same in all industries, but the emphasis on different phases will vary somewhat according to:

1. the type of industry
2. its size
3. its location

An industry about to establish a health program should have a survey made by a qualified doctor or health official to ascertain its special needs.

A small industry should have:

1. first-aid kits
2. some employees trained in first aid as a minimum.

Larger industries should have:

1. a part-time visiting nurse or a full-time nurse, either of whom should work under the direction of a qualified physician
2. a qualified physician who may be part-time or full-time with one or more industries

In some isolated locations it may be necessary to provide staff and equipment so that employees may receive hospital care of injuries or sickness.

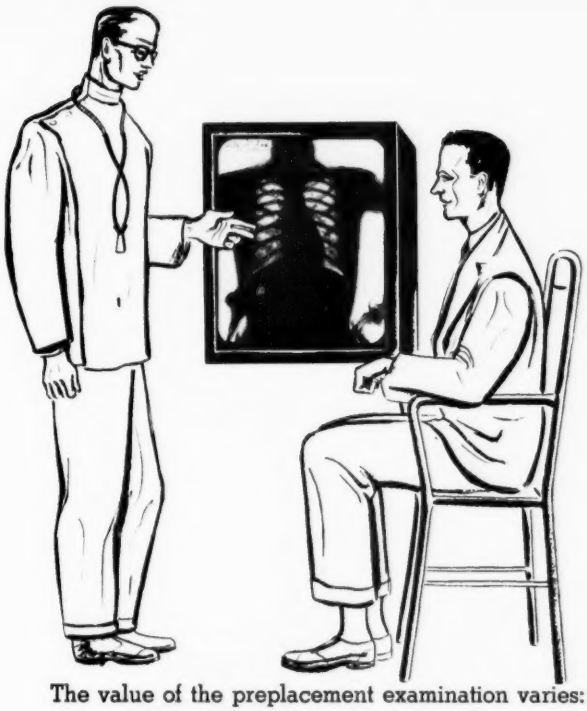
1. Preplacement Examinations

Preplacement examinations should be complete, including:

a) chest x-ray
b) blood serology
c) an evaluation of mental and emotional stability

After a suitable classification has been made, management should be notified of the work limitations only, in order that the employee may be placed on work where he will not be a hazard to himself or others.

Presented before Industrial Medical Conference at Quebec City October 1, 1949 as part of a symposium on the Scope of Industrial Health Services.



The value of the preplacement examination varies:

1. with the information requested, and
2. with the thoroughness with which the examination is performed and the results recorded.

If the individual examiner has little interest in the examination of presumably normal people his evaluation of the physical status and mental and emotional stability of the applicant will be of little assistance to the prospective employee or employer.

If, however, he sees a real opportunity to further preventive medicine by discovering defects or disabilities at a sufficiently early stage so that they may be corrected or prevented from becoming more serious he will perform a real service to all concerned. A man with this vision will probably gain the applicant's confidence easily. He will have good judgment as to what, if any, work limitations will be needed so that the applicant will not be a hazard to himself or others.

While many applicants are examined for a specific job they may be assigned to other positions after proving their value on the job. Hence, it is important that all examinations be complete.

Some preplacement examinations are cursory and miss important points. They should include all systems. Items frequently omitted are:

near vision
color vision
field of vision
depth perception
hearing
condition of the skin
joint and muscle function
chest x-ray
blood serology

Good ***near vision*** is needed in adjusting machinery or equipment or reading gauges, as well as in making reports and in office work.

Color vision is important in driving vehicles, operating equipment with colored signals and matching colored wires or cloth.

Field of vision should be normal if a man is to be a good driver or is supervising equipment spread over a large area.

Lack of ***depth perception*** is a source of many accidents involving truck drivers, crane operators or those operating precision tools or equipment.

Defective hearing is a hazard in many occupations and is a real burden to an executive or a secretary as well as those in other occupations.

Individuals with ***chronic skin conditions*** or allergic eczemas should not be assigned to work with substances known to produce or increase existing skin abnormalities.

Poor ***joint or muscle functioning*** is a hazard in many occupations unless the applicant is specially trained for the work and has appliances which permit him to work safely.

Active tuberculosis may be missed, even by a careful examiner, unless he has a good chest x-ray and report.

Routine ***blood serology*** has revealed cases of positive serology where the infection had not been known or had not been revealed in the history and had not had adequate treatment.

Preplacement medical examinations vary from very thorough complete examinations on the one hand, including chest x-rays, blood serology and urinalysis, to those which were much less complete.

2. Confidential records

The records in all cases should be completely filled in. All medical records should be confidential between the patient and the medical department. Management should receive the medical classification

only and any advice regarding work limitations which the employee needs so that he will not be a hazard to himself or others.

An exception is made in compensation cases where the diagnoses are usually given to management and the Workmen's Compensation Board.

In some companies medical records are held in "confidential" files in the medical department. In others they are kept as part of the general personnel records and can not be considered "confidential."

3. First Aid for the Sick or Injured

First aid for the sick or injured should be provided in all locations so that the best possible emergency care may be rendered to the employee.

In most large plants the facilities for first aid are fairly well developed and include nurses who are interested in health education as well as first-aid work. In most locations nurses work under the supervision of a full or part-time company physician.

4. Rehabilitation of the Sick or Injured

Rehabilitation of the sick or injured is of paramount importance. When an employee has been absent due to sickness or injury the company medical department should cooperate with the family physician and management in endeavoring to rehabilitate the employee as quickly as possible. This may involve training for, and placement in, a different job, or curtailed activities on his old job for a limited period or permanently. When properly placed an individual will do his job more safely and efficiently.

The problem of the rehabilitation of the sick or injured has not been given very much serious thought in most locations. It is generally felt that a person should be able to do his normal work or job when he returns to duty. Some companies do have a rehabilitation program but most companies do not yet realize that the partly disabled, sick or injured are able to perform satisfactory duties when properly trained and if suitable placement can be arranged. Many cases of serious illnesses, however, can be rehabilitated at a much earlier date if they have lighter than normal duties for a short time. This, however, is frequently difficult to arrange.

Employees recovering from sickness or injury return to their normal duties more quickly and adjust better, both mentally and physically, if they are occupied and are performing useful duties.

5. Health Education

Health education may be provided:

a) individually
   1. at the time of the preplacement examination
   2. during first-aid treatment
   3. in talks with the individual on diet, weight, sleep and exercise
   4. at the time of the periodic examination
   5. by the visiting nurse who has an unsurpassed opportunity of carrying on health education in the home

b) to groups
   1. of new employees taking indoctrination courses in company policy
   2. of older employees taking refresher courses in company policy and procedure

Health talks may be illustrated by films, posters and pamphlets and promoted through close cooperation by the employee relations and public relations department.

The amount of health education given varies widely.

6. Sanitation

Sanitation inspections should be performed regularly by a representative of the medical department or by someone under its supervision.

Inspections should be made of:

1. general housekeeping
2. lockers
3. showers
4. toilet facilities
5. canteens — as to diet and sanitary conditions

General sanitation is not usually considered or accepted as a part of the responsibility of the medical services but is frequently left to the building administration or plant maintenance.

The inspection of canteens is frequently not under the supervision of the medical department.

7. Industrial Hygiene

Industrial hygiene is a study of the working conditions, including light, temperature, ventilation, space, industrial hazards due to equipment, environment and materials with which the employee works or materials produced in the operation.

Such studies may be carried on by the industrial physician where the services of a specially trained industrial hygienist are not available. These activities should be an integral part of the health program.

The industrial hygienist hopes, through his work, to have equipment so designed that it will have optimum efficiency insofar as production is concerned and still allow the worker to carry on with maximum efficiency, minimum fatigue and without danger to himself or others.

In recent years the industrial hygienist has drawn to our attention that processes not previously considered hazardous do use or produce substances which cause bodily irritation or illnesses of varying severity.

Few companies are familiar with the service rendered by the industrial hygienist. A few large companies have a central industrial hygiene service which extends its services to individual locations on request. Other companies are members of the Industrial Hygiene Foundation and use their facilities. Still others utilize the services of the government staffs.

8. Reports

The activities of the department should be carefully recorded in all its phases. The individual medical reports should be filed in the confidential file and only reports of a general nature or statistical reports should be made available to management.

The type of statistics kept in medical departments varies from accurate records of all the activities of a complete health service, including morbidity and mortality studies, to those showing the number of visits to the first aid with a breakdown into industrial and non-industrial conditions.

9. Periodic Medical Examinations

Periodic medical examinations should be compulsory where toxic or hazardous employment occurs. Otherwise periodic examinations should be on a voluntary basis.

The frequency of these examinations will depend upon the age, type of work and the conditions found by the examining physician.

The same care should be given to these examinations as to the preplacement examinations. The physician must take sufficient time to do a thorough examination, including work and health history, and to gain the confidence of the worker so that he will discuss his problems freely.

Many of the inefficiencies of the employee are due to poor adjustment to the job, to fellow workers or to conditions away from work.

The choice of physicians for these examinations varies with different companies. In some, the examinations are performed by physicians or clinics who frequently lack knowledge of the working conditions and associations. A full-time or part-time company medical examiner should be aware of these conditions and gain the confidence and cooperation of the employee more quickly than an outside doctor. He should be in a better position to advise the employee and (with the employee's consent) to discuss work limitations or changes with management.

The employee should be referred to the family physician for the treatment of conditions discovered at the periodic examination. Periodic examinations vary in different locations in scope, frequency and the organization level of employees for whom the examinations are available.

The most common procedure is to have regular compulsory periodic examinations for all those working on toxic materials, and food handlers. Some have compulsory examinations for the executive groups and have voluntary periodic examinations for those returning from serious illnesses and/or upon request. In some

locations, all employees returning from an absence due to illness over seven days receive an examination.

The extent of the periodic examination varies from a brief check on blood pressure, heart, lungs and urine to a very elaborate check up, system by system, including blood chemistry, G.I. series, etc.

Mobile units of a trailer type, fully equipped to do complete periodic examinations including chest x-rays and laboratory work, are being used in areas with scattered populations.

10. Medical Care in Isolated Regions

In locations where medical care is available its provision should be the responsibility of the employee who may, however, be aided considerably by company or employees-sponsored plans for sickness benefits, hospitalization and medical care.

In isolated communities where there are no medical services available it will be necessary to provide adequate coverage for the worker and his family.

Requisites for Efficient Functioning

In order that the industrial health program may function satisfactorily, the medical director should report directly to top management and not through other departments. He should be willing and desirous to cooperate with other departments in the development and administration of company policies relating to subjects of mutual interest such as employment, terminations, transfers, promotions, sickness and accident cases, safety, hospitalization and pensions. He should coordinate the activities of the medical department with those of government and community health organizations.

To summarize, the scope of medical services available in different industries varies a great deal from one location to another. We would recommend that the medical standards in industrial medical practices should be maintained at the highest possible level.

PANEL DISCUSSION ON THE *Selection and Training* OF INDUSTRIAL NURSES

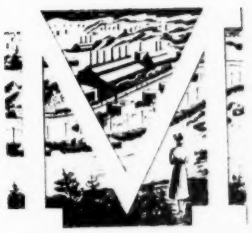
K. C. Charron, M.D. Chief
Industrial Health Division
Department of National Health & Welfare, Ottawa

Miss M. I. Walker, M.A., R.N.
Senior Nursing Consultant
Industrial Health Division, Ottawa

Miss Sarah Wallace, R.N.
Consultant, Industrial Health Nursing
Division of Industrial Hygiene
Department of Health, Toronto

Miss Mildred Brogan, B.A., R.N., Staff Nurse
The Bell Telephone Company of Canada, Montreal

THE NEED FOR *Developing Techniques* OF SELECTION AND TRAINING



By Dr. K. C. Charron

Y RESPONSIBILITY DURING this preliminary period of formal presentation before discussion is to try to establish the need for developing techniques of selection for industrial nurses and for accepted standards of training in industrial nursing in Canada. Industrial nurses furnish the day by day application of many of the principles and techniques of modern industrial health practice. The qualifications, training and personal suitability of nurses in this field are of particular interest to this group.

The history of industrial nursing in Canada extends over 40 years. It began in a small way as a family health service. Workmen's compensation legislation changed the emphasis to emergency care. The subsequent development closely parallels the extension of industrial health services to a greater number of firms and covering a wider scope of activity. Industrial nurses and industrial physicians are definitely established as distinct branches of the two professions and are rapidly becoming part of the modern industrial structure. In Canada today there are about 1000 industrial nurses and this number is on the increase. Seventy per cent are employed in Ontario and Quebec and over 50% work alone. This number is small when compared with the total required to provide adequate health service for Canadian industry. Nevertheless it represents a valuable nucleus around which future development can take place.

Many industrial nurses have had to acquire skills and knowledge after entering industry. They have been the pioneers and have accomplished a great deal. They realize, however, that the widening scope of the industrial nurse's work makes it imperative to establish a pattern setting out desirable qualifications for industrial nurses. These desirable qualifications will include professional competence, experience and personal suitability.

Recent developments indicate that industrial nurses and nurse educators are tackling these problems in a realistic fashion. The Ontario nurses have formed an industrial nursing section and have asked for recognition by the Registered Nurses' Association. The Quebec nurses have been very active and are considering similar steps. Industrial nurses in many of the other provinces, although few in number, hold regular meetings and keep up to date with modern trends. From

Presented before Industrial Medical Conference at Quebec City, September 29, 1949

time to time the nurses organize courses and institutes on industrial nursing. They are directed particularly towards nurses already in the field and are well attended and cover a wide variety of subjects. For example, an institute was recently held at Queen's University. More than 60 nurses attended from various centres in Ontario and Quebec. The institute highlighted industrial relations. Other features included plant visits, demonstrations and lectures on the role of the nurse in industry, workmen's compensation, tuberculosis control, industrial medical records, newer surgical treatments and drugs and the nursing approach to industrial medicine. Another type of course was held in Ottawa about one year ago. It consisted of a series of lectures and demonstrations held in the evening, one evening a week for 12 weeks. The average attendance for this course was more than 80. Individual interest is shown by the frequent requests for information and advice on a wide variety of subjects such as desirable qualifications, available courses of training, positions vacant and so on.

This enthusiasm on the part of industrial nurses is being appreciated by industrial physicians throughout the country. Industrial physicians realize that a well-trained industrial nurse is an important member of the industrial health team and is essential to a good industrial health service. The inclusion of this panel discussion on the agenda and the presence of three outstanding representatives of industrial nurses at this discussion is a happy reflection of the cooperation and understanding between these two professions in this field. The nurses are attempting to supplement the usual hospital training and postgraduate courses with new and progressive courses pertinent to industrial nursing. They are hoping that the exchange of views with experienced industrial physicians here today will assist in establishing future trends.

Industry and labor are also concerned. As industrial medical services are being accepted as part of our modern industrial structure the results produced by the industrial medical department are closely observed. Management and labor expect more than emergency care and if satisfactory service is to be supplied well-trained nursing staff is essential.

When the nurse first enters the industrial field she finds herself in a very different environment to that of a hospital, laboratory, clinic or community health service. There are recognized lines of authority in industry and she must follow the accepted industrial pattern. The industrial nurse must appreciate the importance of maintaining good industrial and community relations and it will be necessary for her to establish a satisfactory relationship with management, labor, the industrial physician, general practitioners in the area and community health and social agencies. She should realize also that certain phases of the industrial health program must be left to the physician —particularly diagnosis and outlining treatment.

Although a few nurses engaged in large industrial set-ups have specific duties to carry out, the majority of industrial nurses in Canada employed in smaller units are expected to be familiar with all phases of the industrial nursing program. They frequently work alone with a part-time physician or one "on call" providing the only professional guidance. They may be called upon to assist or to make decisions on a wide variety of problems, depending on the type of service established in the industrial organization. The multiple duties which industrial nurses may be called upon to perform will be described by other speakers and will serve to highlight the need for standards of training and experience.

Industrial nurses may be divided into three groups: (1) industrial staff nurses, (2) industrial nursing supervisors and (3) industrial nursing consultants. Industrial staff nurses and industrial nursing supervisors are employed at plant level. Industrial nursing consultants, up to the present, are employed by official agencies. A large majority of the industrial nurses in Canada are industrial staff nurses and, as mentioned before, over 50% work alone. There are a smaller number of industrial nursing supervisors and only a very few industrial nursing consultants. In addition, small Canadian firms occasionally employ visiting nurses on a part-time basis. This type of service may be supplied by private nurses or by nursing agencies such as the Victorian Order of Nurses for Canada. These part-time services are as wide in scope as full-time, and nurses employed on this basis need the qualifications and other attributes of the full-time industrial nurse.

Subsequent speakers will consider in detail the special problems of selection and training. They will outline procedures designed to assist industrial physi-

cians and others in the selection of nursing personnel; they will describe special training to prepare nurses for industry and "in service" training which will help nurses already in the field. I think you will agree that, although there are features of industrial nursing common to other fields, there are many aspects which pertain to industrial nursing alone. This point of departure is appreciated by nursing educators and subjects such as industrial relations and development, business and labor law, industrial toxicology and hygiene, medical records in industry, plant organization and related subjects are considered necessary adjuncts to the training of nurses for industry. Methods of approach have been and are being discussed and the views of this group as an interested party will assist in formulating future plans.

The approval and active support of medical groups and industry would assist in obtaining a widespread acceptance of future policies. The qualified nurse would receive preferential treatment, industry would be provided with a better service and the doctor would secure a more capable ally.

The Selection of Nurses FOR INDUSTRY

By Miss M. I. Walker, R.N.

In the selection of personnel, the leaders in a field feel they must have superior people for certain reasons specified. The term superior must be qualified for that field of endeavor as one may be superior in one field and quite inadequate in another. It is now recognized by industry in general and by medical and personnel directors in particular that the industrial nurse needs certain qualifications for success. Although it is a young profession, certain characteristics based on our concept of the role of the nurse in industry are slowly emerging.

The role and responsibilities of the nurse in industry are:—

1. To promote the health of the worker in industry as related to that industry, to the family unit and to the community in which that industry is situated.
2. (a) To assist in the safety program in making the place of work safe for the worker as far as it is possible; and in the education of the worker to be safety conscious.
   (b) To investigate accident proneness in a worker for the safety of the worker and management.
3. To assist in promoting good personnel relations —building friendly relationships among all workers—a part of the personnel and industrial relations program.

This role as outlined has changed from the main emphasis on first aid and emergencies to the very important role of assisting in building friendly relationships towards developing a happy, efficient worker who has faith in his industry. To be competent one must be happy and to be happy one must be competent. Morale is a state of faith and every industrialist desires high morale among his employees. The physicians and nurses build morale especially in the dangerous industries by a high degree of medical skill so that the worker knows if injured he will receive expert treatment. Emotionally he receives as high a quality of skill when the physician and nurse recognize the worker's problem is important to him and counsel him to gain insight into his problem and make a satisfactory

adjustment to living. This all requires qualifications which are suggested for your consideration.

Let us think of the factors of selection of nurses from two angles: (1) the nursing personnel available, (2) the industry.

I do not expect there will be agreement on the qualifications as listed, just as very few could agree on the definition of a pleasing personality as an example of qualifications necessary for this field. Usually the pleasing personality is the first characteristic listed, yet it would be difficult to define. She must have the art of nursing. Professor Cameron at the Queens University Institute for Industrial Nurses reminded us again and again that one can teach the science of nursing but not the art. How then can the industrialist, physician and personnel manager be certain this nurse has the art of nursing, a pleasing personality and other qualifications according to the needs of that industry?

Let's look at the industrial nurse. She must have:

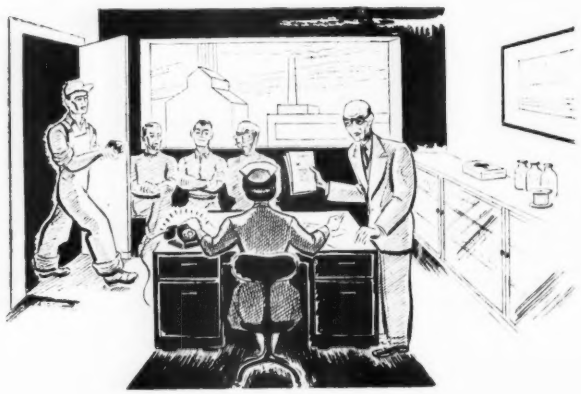
(1) Good Health —

It is much easier to teach health when one looks healthy and lives healthily — diet, rest, recreation, good personal hygiene and so forth. This also includes the responsive, dexterous person (motor dexterity), full of zest and enthusiasm for the day's work. It assists in developing that pleasing personality. If one is not well, how can one respond to a health problem objectively? Health includes good grooming with a dash of glamor and smartly uniformed.

(2) Intelligence —

There is a guidance brochure from one university instructing students to take an inventory of qualities for entering university. It is entitled ***Brains Aren't Everything.**** A dean of medicine wrote under this caption: ***Oh Brother, How They Help!*** There are some special abilities necessary for the industrial nurse, especially the supervisor and the nurse working alone on a shift. When the door bell or the telephone rings she does not know what situation may be presented to her. It may be an accident, a health problem physical or emotional, or it may be one of top management to visit the health centre. It may mean she can solve it alone. It may involve personnel relations such as the foreman, personnel office, family physician, dentist or many other factors. Therefore she needs the ability to adjust readily to new situations, the ability to see relationships and the ability to project or plan ahead. These are qualifications of the superior person in our society. Added to this native ability she needs to have lived in a cultured home where she has had emotional and social security and where she has been guided to develop clearly a high sense of values and good judgment at her level of maturity.

*A Lehigh University Publication in Guidance, Bethlehem, Penn.



It is difficult in an interview and application to know the intellectual level of a nurse. One feels, however, in this Canada of ours with education available to most, that one should take the high school record as of some value. High school graduation is now generally accepted as a minimum for an applicant to a school of nursing.

Professional record and work record should indicate some measure of ability. The personnel manager and medical adviser, in the selection of nursing personnel, should pool resources in choosing their supervisor. Assistance may be obtained through a nurse of some status to interpret records from hospitals and health organizations. In choosing staff the supervisor of your health service must be a member of the group making the choice.

To evaluate reports from hospital schools of nursing it would be necessary to specify the strengths or assets for the nurse you require in your industry. Some schools are generous, some sparing in reporting a nurse's assets. You will need to consider the merits of the report and the rating of that hospital and school of nursing.

(3) Social Competence —

Social competence is as important in rating the efficient industrial nurse as it is in the medical adviser or other personnel responsible for the well-being of the employees. There is constant interaction between nature and society. The nurse must have social competency not only to be aware of this interaction but to assist in it constructively. Not all individuals have this ability. Some have it to a marked degree while others are devoid of it. Society could be arranged along the curve of distribution with this ability as we do abstract intelligence. Her work record should show social as well as professional growth and development. Social adjustment is measured by different criteria at different levels. The nurse with 15 years experience should show some difference to the one with three years experience. In industry, the record of the past five years is considered in the employment of an individual. In choosing a supervisor or a nurse working alone,

one should see her total professional record. The method of presentation of that record would be of value in measuring her social competence.

Social maturity or adulthood must be developed. It does not just happen. It is the coordination and integration of the wholesome personality. The more one reacts in an adult way, the more definitely is the pattern established. The personnel in the health centre must have self-discipline to be well integrated, socially competent individuals giving the confidence and assurance to the employees who come needing medical care and health appraisals.

Some of the characteristics of maturity:

(a) The ability to adjust at the social level required, the ability to get along with people and the ability to adjust to new situations. You see, the ability to get along with people and adjust to new situations should be an accomplishment of all of us, not some rare gift over which we have no control.

(b) One who is ready and willing to assume responsibility. If one accepts a position, one should know what responsibilities are being assumed. Therefore there should be personnel policies and practices outlined for the health centre. Any changes made by management which affect the health centre should be first discussed with the medical adviser and his personnel. If these policies are not acceptable the personnel should not remain but go elsewhere to find policies which are acceptable. This does not mean the mature person always agrees with management but it does mean she does not go round and round in a groove, complaining without showing progress. There must be a definition of responsibilities in the beginning. If not certain, have an understanding with the applicant that these are to be developed with her assistance.

(c) The mature person works with both sexes with equal objectivity and friendliness.

(d) There should be full emancipation from the parental roof. This includes parents and also officers who represent authority. Note her reaction to authority such as parents, former employer, the community in which she lives and her fellow workers, and the extent to which she has learned to win the approval of her group and her superiors. This is important for the nurse in industry so she will be objective in her relations with both management and labor. The health centre must be as one writer said of the nurse in industry during the war, "as neutral as Switzerland and as helpful as St. Christopher." Even at that we are sometimes misquoted and we must be ready for criticism, knowing what was stated and showing reason for it.

(e) A satisfying philosophy of life is a requisite of the personnel in the health centre. With some people —

Life is a place
Where we dig in the ditch
To get money enough
To buy food enough
To get strength enough
To dig in the ditch.

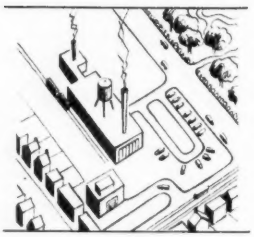
The philosophy upon which we built the health service at Phillips Electrical Works is the personnel point of view which is evidenced by respect for the integrity and personal worth of every individual. In order to make it effective it must be a part of one's own philosophy. "What you are speaks so loudly I cannot hear what you say", so states an old Chinese proverb.

(4) Professional Qualifications

The registered graduate nurse's credentials are the first requisites and no doubt accepted by all. In Quebec she must be licensed to practise as a nurse. From here out there will be a variety of opinions. The program in your industry will govern the qualifications which the nurse has beyond this first level which has been stated. If the industry's program includes health teaching and health appraisal of the worker through the health examination, then she should have some knowledge of the principles and practices of a health service. The existing facilities are found in public health nursing formal courses in universities. There is also the nurse in some areas who may obtain experience in family health counselling without this formal course. One area is to be found within the visiting nursing services of the Victorian Order of Nurses for Canada and the St. Elizabeth Visiting Nursing Service. There are other spheres where the nurse may get valuable background for industry. This could be in one of the social service fields such as the Department of Public Welfare in Ontario, investigating blind, old age and mother's allowance cases. These nurses have been briefed on the social aspects of home visiting and social welfare. It is not possible to have enough public health nurses to meet the needs of industry. There is a shortage in the general public health field. Also these courses do not educate the nurse in industrial relations which is a very important part of the personnel in the health centre. However, if you have an applicant with a formal course in public health nursing and good community experience the physician and personnel manager can soon teach her the principles of industrial relations. If she has industrial nursing experi-

ence it would be a real asset.

In my judgment the nurse, especially the supervisor and the nurse working alone, should be a registered graduate nurse with a knowledge and some experience in health teaching and counselling as well as some knowledge of industrial relations, especially labor-management relations. Management should encourage her to give some leadership within her professional organization as this indicates status and maturity professionally. The nursing profession in general needs leadership from industrial nurses for in my experience we have a keen, intelligent group who can bring from industry some techniques helpful to the organization of nursing.



Community service experience is valuable for your industry is a closely knit community and the techniques the nurse learns through experience in a community agency are applicable to industry.

The supervisor needs administrative and supervisory ability. She needs to have a high sense of values to make decisions and stand by them. This reminds me of the comment of a great baseball umpire who said an umpire needs to be able to make the right decision quickly and stand by it in spite of everything, and this he said can not be taught in any school. It is a part of all an individual is and has met.

To choose the nurse, take the total personality plus the professional background and experience. Look at it all in the light of the needs of your industrial health service, plus the role and status of the nurse in your industry. Here are some points the nurse should consider when she is interviewed. Also, the person selecting the nurse should consider these as they will relate to her suitability for the job:

1. Plant Facilities —
   (a) Is it a pleasant and happy place in which to work?
   (b) Location and type of buildings
   (c) Availability to the community and living accommodation
   (d) Travel resources
2. Type of Industry or Service —
   (a) Is it mainly health counselling among salaried people?
   (b) Is it considered among the heavy industries? This requires surgical ability and training because of the possible severe injuries.
   (c) The hazards of this industry
   (d) The safety program and her participation on the safety committee and its program
   (e) Attitude of management to the safety of the worker.
   Is management meeting legal responsibilities only, or has it concern for the safety of the worker and its effect on his morale?
3. Type of Worker —
   What class of worker is attracted to this industry?
   (a) Is it the industry which attracts him?
   (b) Has he outside interests and hobbies, reflecting creativity and resourcefulness of the employee in his leisure time?
   (c) The stability of employees and employment
   (d) Educability of the employees for health teaching
4. Social Status of the industry and the employees in the community.
5. Social Climate of the Industry
   This is set from the top down by the leaders in the industry. It reflects the quality and influences the morale of the employees. If it is a democratic social climate the personnel relations will be more friendly and the role of the nurse in building friendly relationships will be less difficult.
6. The resources of the community to meet accident and illness and other needs of the family are important factors.
7. Relationship of the Staff of the Health Centre to the Industry —
   (a) Adequacy of the equipment will reflect the attitude of management and especially the medical leadership
   (b) Adequacy of the salaries; does she benefit from personnel policies as other salaried workers? If a nurse is sufficiently efficient to remain on your staff she should warrant an increase in salary according to the personnel practices within the industry
   (c) Size of staff and plan of shift work to cover the service
   (d) Her relationship with other departments, especially the lines of communications with foremen, personnel office and the accessibility of top management

IN SUMMARY: To choose a nurse —

1. Begin early.
2. Accept the fact that there are not enough graduate nurses in any nation of the world to meet the

needs of its people. It is a woman's profession and we lose a high percentage to marriage. Fortunately a married nurse works acceptably in industry.

3. Outline her status in your industry, comparing her with other supervisors and professional or technical staff.

4. Outline the role expected of her.

Is it first aid only to meet the legal aspects or is it for the well-being of the whole industry from the floorman, the foreman, to the general manager.

5. In personal and professional qualifications, if you choose one highly qualified, be prepared to give consideration to her abilities and delegate authority accordingly. Give her every support and confidence.

6. It is wise to advertise the vacancy. Well qualified nurses will learn of the vacancy and may apply when otherwise they may not be approached for ethical reasons.

7. The interview should follow the same procedure as the employment interview for other technical staff.

8. Check her credentials presented — hospital diploma, registration in the province (licence in Quebec), post graduate such as certificate or diploma from a university e.g. public health nursing.

9. Take time, if possible, to have reports from some nurse or agency whose judgment you have learned to respect and with whom the applicant has had contact.

10. Sum up all the information and the results of the interview — her qualifications, the needs of your industry — and choose the nurse you feel will serve best. From there out accept her as a professional employee who can do much to help build morale and thus efficiency among the employees in your industry.

Preparation For INDUSTRIAL NURSING

By **Miss Sarah Wallace, R.N.**

As a second part of this panel an attempt will be made to discuss the need for acceptable basic education for nurses entering the field of industrial nursing. It is proposed to discuss such an educational program under three headings.

(1) Necessary background, (2) courses offered in the United States, England and Canada today, and (3) two possible training courses.

It might be well to state here that in my opinion it is not necessary for a nurse to hold a post-graduate degree or certificate in order to do a good job. However we all do better work the more we can learn about our particular task. Many nurses in the past have gone into industry with no special knowledge of this branch of nursing but by trial and error methods have built up a good service. Today we live in a scientific age and should approach the problem of industrial nursing education in a scientific manner.

The background requirements for a nurse entering the field of industrial nursing may be divided into four major parts, viz. :

A. Clinical nursing and first aid
B. Health supervision of adults
C. Knowledge of environmental hazards and accident prevention
D. Understanding of industrial relationships

Considering these in detail—

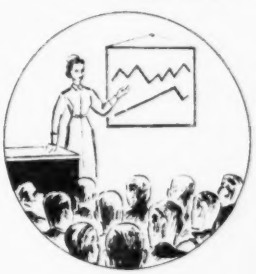
A. Clinical Nursing and First Aid: necessitates training in carrying out routine treatments ordered by the physician in charge, assisting with physical examinations and doing laboratory work. Such training is obtained by meeting the requirements of nurse registration in any of the provinces.

B. Health Supervision of Adults: which requires —

1. Training in psychology in order to decide upon the right approach to each individual.

2. Familiarity with the techniques of interviewing and counselling.

3. An understanding of the relationship between emotional and physical health.



4. Sufficient training to recognize and use the opportunities for teaching good health practices. Training in adult health supervision may be obtained by taking the public health nursing course given at many of the universities throughout Canada.

5. A background of preventive medicine and nutrition.

6. An appreciation of the importance of keeping proper medical records. More effective health counselling can be done when a detailed record of a worker's past visits is available. The overall picture obtained from such records can lead to an improved accident and illness prevention program.

C. Environmental Hazards and Accident Prevention: requires —

1. A knowledge of the environmental hazards encountered in industry in order to seek intelligently for the cause of an occupational disability.

2. A recognition of the relationship between emotional upsets and accidents, and the possible connection of home as well as work factors with plant accidents.

D. Industrial Relationships

1. It is most important that the nurse be made to realize that the health service is only one small part of the production set-up and must dove-tail with the general pattern of the organization.

2. A background of sociology and social welfare enables the nurse to use intelligently the resources of the community for the benefit of the workers. It also helps her gain a better understanding of labor-management problems.

As stated above, preparation for clinical nursing and health supervision of adults is readily obtainable. Information pertaining to the last two mentioned, namely environmental hazards and accident prevention and industrial relationships is available now in general only through reading, attending lectures, university extension courses and on the job.

A survey of courses now offered in the United States, England and Canada may help in later discussion. In all three countries courses available for industrial nurses are under the direct supervision of some accredited university or an organization affiliated with such a university.

In the United States these courses cover to a greater or lesser extent the four major requirements outlined and within wide limits may be divided into the following groups:

1. Prescribed courses leading to a bachelor degree, majoring in industrial nursing

2. The public health nursing certificate course with a unit of industrial work included

3. Industrial nursing courses of varying length which may be taken as minor credits in a degree course

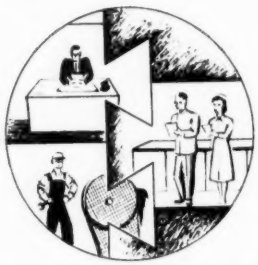
4. Non-credit courses

Because of lack of standardization particularly in groups three and four, the Committee on Education of the American Association of Industrial Nurses at the annual meeting in Detroit, April 1949 made this recommendation: "Recommend that the objective of industrial nursing education be a baccalaureate and not a certificate course. Recommend further that the committee concentrate its attention on a few good courses rather than a larger number of indifferent ones. Recommend still further that the American Association of Industrial Nurses establish four scholarships for the preparation of instructors."

In England The Royal College of Nursing has been most instrumental in directing training in the various nursing fields. At present three main types of courses are offered

1. A full time six months course leading to an industrial nursing certificate

2. A part time course for nurses with the educational standing required for the full time course but who are unable to leave work for the necessary six months. The course covers two academic years (Sept.—mid July). During the first year classes are attended two nights a week, and in the second year one night a week. This too leads to the Industrial Nursing Certificate.



3. A full time 12 months residential course in connection with Birmingham Accident Hospital and leading to an industrial nursing certificate. In addition to this basic preparation provision is made for advanced study for teachers and senior administrators.

In Canada the only course specifically designed to prepare nurses for work in industry is given at the University of Toronto School of Nursing. This has been offered for the past three years. It is open only to nurses with a minimum of two years nursing experience who are enrolled in the one year general public health nursing certificate course, and who have maintained high grades in the first term of the course. It is one month longer than the general course. Adjustments are made in the curriculum giving a minimum of time in certain subjects but still qualifying the nurse for the general certificate. It is too soon to comment on the success of this course, particularly as these nurses are urged to gain experience in community health work before going into industry and as it is only two years since the first class graduated. It might be of interest to mention that out of eight graduating in the first class, 1947, three chose full time industrial nursing positions and two entered agencies giving some

type of part-time industrial service. Of the second class of 14, only two chose full time industrial nursing positions and two were engaged by agencies giving a part-time service. The other nurses of both years were employed by one of the official or voluntary public health nursing agencies.

Since we now have in the neighborhood of 1000 industrial nurses in Canada, the need for replacement as well as expansion is sufficient to warrant special training courses for this branch of nursing. There are two schools of thought regarding education for industrial nursing, viz.:

1. Short courses of three to six months

2. Substitution and addition of subjects in the present public health nursing courses

The following will indicate the advantages and disadvantages of these two types:

The short courses of three to six months

A. Advantages

(1) Large numbers of nurses can be given some preparation in relatively short periods of time.

(2) More industries are likely to grant leave of absence to their nurses for such a course.

B. Disadvantages —

(1) Satisfactory field work for large numbers of students is difficult to arrange.

(2) Preparation would necessarily be sketchy to cover the background requirements previously discussed namely, psychology, sociology, counselling techniques, accident prevention, etc.

The longer course with substitution and addition to the public health nursing course.

A. Advantages —

A course such as this gives the nurse considerable scope in public health nursing, the three main branches of which are voluntary public health nursing agencies, official public health nursing agencies and industry. The experience gained in any one increases her value in the others. At present in Canada a few of the small industries with under 250 employees, of which there are many, are being satisfactorily served with a part time service given by the Victorian Order of Nurses, one of the voluntary public health nursing agencies. For example in Ontario approximately 25 of these small plants in seven cities and towns throughout the province are being thus served.

B. Disadvantages —

(1) It is a longer, more costly course for the individual nurse.

(2) It is a slower method of training personnel.

(3) Fewer nurses are likely to be granted leave of absence from industry to take the course.

Although nurses with public health training are badly needed in other fields, if a personal feeling may be expressed it does seem that nurses with public health and industrial nursing training could greatly reduce the work of the nurse in the community and make more effective use of nursing time. The nurse in industry is in a very strategic position with easy access to the family breadwinner. This attitude that the industrial worker is the major link in the public health program was well expressed in an article appearing in *The Globe and Mail*, Toronto, July 29th, 1949, when one doctor looked forward "to the time when health statistics from schools would be carried into industry; when the family breadwinner would be the key to public health; when health schemes would not depend on public funds."

Industrial nursing is a challenging specialized field with many opportunities for helping improve both the mental and physical health of workers and thus contribute materially to increased output in commercial enterprises as well as manufacturing industry. These opportunities in many instances are being lost because on one hand physicians and/or nurses are not always alert to the possibilities and on the other hand management does not always fully appreciate the place and value of a medical service in business. If the nursing profession is to keep pace with the developments in the industrial world we must keep an open mind and make adjustments in our educational courses for nurses so that they may be adequately prepared to meet the demands of modern industry. Our universities are ready and willing to cooperate in providing these courses but they need leadership and guidance from those engaged in the field. Industrial nursing education is a topic requiring considerable thought and study if acceptable basic courses are to be established. The Canadian Public Health Association included industrial nursing in a recent survey of public health nursing across Canada. Although the industrial portion was limited the brief survey report suggests the need for further study if nursing in industry is to maintain a standard comparable to other branches in the nursing profession; if industry is to receive the most satisfactory service for money expended and if nurses themselves are to receive the personal satisfaction which comes when one feels that a job is being well done.

Training Within Industry

OR ON THE JOB TRAINING

By **Miss Mildred Brogan, R.N.**

When we consider the training of the industrial nurse within industry, it is logical to begin with her induction and orientation into the new job. On whom does the responsibility of the nurse's induction and orientation lie? We have assumed that the industrial nurse will always be working under medical supervision, hence the responsibility is that of the medical director. Depending on the size and organization of the medical department, the medical director may delegate this responsibility to his assistant or the nursing supervisor. Whoever this person is he or she must have administrative responsibilities.

A definite length of time should be devoted to this period of induction and orientation. A minimum of two or three weeks is suggested, depending on the size of the organization. This is a short period when we consider the length of time spent in training various other employees. During this time the nurse should not be made responsible for nursing service. Her time should be occupied with acquainting herself with her new position and surroundings.

The nursing supervisor or whoever is responsible for the induction and orientation of the new industrial nurse should have a definite program which should include the following objectives:

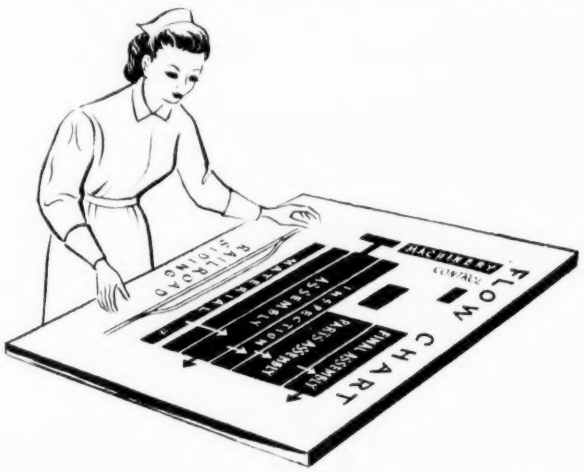
1. To give the nurse an appreciation of industrial nursing i.e., to show her how nursing skills can be applied to groups of men and women at their place of work in order to help these employees build and maintain their highest level of physical and mental health by means of (a) preventive medicine, (b) health education and health counselling, (c) prompt and efficient nursing assistance when employees become ill or are injured, (d) as well as cooperation with community agencies.
2. To create an awareness of the interrelationship and the necessary close cooperation between the various departments within the industry, namely the medical, personnel, safety, dietetic and benefit departments as well as the plant itself.

   In order to accomplish these objectives it is necessary for the new industrial nurse to become acquainted with some general information regarding the industry. She should be informed of (1) the type of plant, (2) the position of the industry in the community, (3) the topography of the industry, (4) the products which are sold locally and exported, (5) the contribution of the industry to the economic life of the community, (6) the industrial hazards encountered in the industry, (7) the number of employees — the proportion of men and women, (8) the range of occupations, (9) the educational standards, the folkways and mores of the employees as this information will have a great bearing on the type of health education which she will give, (10) she should also know the unions which are active within the company.

I cannot over-emphasize the importance and value of having a manual containing the policies of the medical department, the routine procedure carried out by the medical department as well as signed standing orders for nurses. The supervisor should go over the contents of the manual with the new nurse. It is very important that the nurse should realize the place of the medical department in the industrial organization. Charts illustrating the organization of the company and the medical department organization are most helpful.

The new industrial nurse should meet the entire personnel of the medical department and should be told of the definite responsibilities of each member of the staff, including the clerical workers. With such knowledge and clearly defined responsibilities the industrial nurse will be much more capable of performing her duties and she will derive more pleasure from her work and will work much more intelligently.

It is most essential that the new nurse should become acquainted with the program carried on in the medical department. She should be given the opportunity of observing every activity within the depart-



ment. This includes preplacement examination, periodic examination, return to work visit to medical and the procedure for planned follow-up of remedial defects, etc. She should be encouraged to participate in all activities and once the supervisor is satisfied that the nurse is capable of carrying on alone, then and only then should she be given definite responsibilities.

The nursing supervisor must be sure that the new industrial nurse understands the "why" as well as the "how" of keeping records and reports.

The nurse will write much more intelligent reports and records if she knows the purpose and use of each one. She should also know "where" and "for how long" these records are kept.

The new nurse should be given the opportunity of accompanying the visiting nurse so that she will become familiar with this phase of the medical program.

Every industrial nurse must be a health teacher. Depending on the organization the nurse may be responsible for individual, group and mass teaching. During her induction period she must become aware of her role in the organized health activities. She must know what and how to teach. It is evident that some nurses need more assistance in this phase of their work than others.

The medical department should have a small library containing appropriate reference books for industrial nurses. The library should include:

1. A copy of the workmen's compensation laws
2. A copy of the provincial health regulations re industrial establishments
3. McGrath, Bethel — ***Nursing in Commerce and Industry,*** Commonwealth Fund, 1945
4. Hamilton, M. D. Alice, ***Exploring the Dangerous Trades,*** Boston, Little, Brown and Company, 1943.
5. United States Public Health Service, ***Manual of Industrial Hygiene.***
6. Anatomy and Physiology and Nursing Pharmacology text books (it is suggested that textbooks with which the nurses are familiar are recommended)
7. Social service directory
8. Medical dictionary
9. Samples of approved health teaching materials

The new nurse should become familiar with the content of these books and an hour or two of each day in the induction program could be allotted to study in the medical department.

It is also very important that the industrial nurse should be aware of the available community health and welfare agencies. A well organized manual will contain information regarding the use of the community agencies as well as the plan for exchanging information with these agencies. If the new nurse is unfamiliar with these organizations a visit to each agency would prove most beneficial as she would appreciate the benefits offered to the employees.

The industrial nurse must also become familiar with the list of approved physicians and dentists to whom she can refer the employees, depending on her written standing orders; and she must also know how to report communicable and occupational diseases.

In order that the industrial nurse will be able to deal more intelligently with the employee it is appropriate that she should be given the opportunity of

touring the plant. It is suggested that the safety engineer should conduct this tour. Depending on the size of the plant it might be advisable to visit only part of the plant at one time as it would be much less fatiguing and the observer would be much more likely to retain more of her observations. While touring the plant the industrial nurse should be given the opportunity of observing the substances used in the various processes. She should also observe the physical structure of the plant; the working conditions, including the ventilation, lighting, heating, humidity and noise; the hours which the employees work; the rest periods which are observed and what facilities are provided for the employees during their rest periods as well as the adequacy of the eating facilities because all these conditions will have definite effects on labor turnover and absenteeism. Throughout the tour of the plant emphasis should be placed on the engineering, medical and nursing aspects of controlling existing industrial hazards.

After the industrial nurse has spent some time in the medical department and has toured the plant it would be appropriate for her to spend some time in the personnel department where she should be given the opportunity of conferring with the personnel director who would give her the overall picture of the activities of the department.

The industrial nurse should be permitted to observe the orientation of new employees i.e., the manner in which applications are handled, how applicants are interviewed, what specific tests are given, how references are verified and how the final decision of acceptance or rejection is reached through the interpretation and evaluation of the findings. If the nurse has passed through the personnel department as an applicant she will have a much keener appreciation of the applicant's feelings. At all times the nurse's attention should be drawn to the interrelationship and cooperation between the medical and personnel departments. The use of the records exchanged between these departments must be made known. In this way the nurse will always complete these records more intelligently. While in the personnel department the nurse should become familiar with job analysis. Thus she will be aware of the reason for many medical procedures, for example the frequent periodic examination of a crane man's vision.

She should also participate in the induction program sponsored by the personnel department. In this manner she will learn company policy, the administration and organization of the company, the various departmental functions and the inter-departmental activities. If such a program is not sponsored by personnel it becomes the medical department's responsibility to furnish the nurse with this information. An outline of this information should also be included in the manual of policies and procedures prepared by the medical department.

From the personnel department it would be appropriate for the nurse to spend some time in the safety department where she should confer with the safety director and receive a bird's eye view of the company's safety activities. She should understand the organization of the safety department, the procedure and frequency of their meetings and, as it is accepted that the medical department should be represented at all safety meetings, it would be very appropriate to have the new nurse sit in on at least one of these meetings. She should also know the content of the educational activities carried on by the safety department as health and safety are so closely related. Likewise she should become familiar with the safety manual. The records and reports kept by the safety department are of real interest to the nurse as many are compiled through the cooperation of the medical department. The new industrial nurse should attend the induction program sponsored by the safety department.

It would be well for the nurse to spend some time in the dietetic department. Here she should confer with the head of the department who may or may not

be a trained nutritionist. She should observe the adequacy of the food facilities and she should become aware of the educational activities provided by this department. It would be ideal for the medical department to be able to refer the employees with nutrition problems to the company nutritionist. In the dietetic department the nurse can also observe the interrelationship and cooperation with the medical department. For example, all food handlers must undergo periodic health examinations according to the law.

From the dietetic department the nurse could proceed to the benefit department. In the benefit department she should have the opportunity of speaking with the director and thus she will become familiar with the plant welfare provisions, i.e. the recreational program, the retirement plan, the various types of available insurance such as compensation, group life, health and accident, hospitalization and sick benefits. The name of the insurance company carrying the company policies is very important as some insurance companies provide excellent health teaching material. With every welfare provision the nurse must become aware of the medical department's contribution towards the program.

The induction and orientation which I have described could be applied to most industries. However, there may be occasions when it would be advisable for the new nurse in a small new medical department to receive some orientation in a similarly well organized, well established medical department in another company. Such orientation could be arranged by the provincial industrial nursing consultant.

It would be unfitting to put so much emphasis on education during the induction period if some plan for staff education were not continued throughout the nurse's experience in industry. Regardless of the size of the industry, the small medical library previously mentioned helps to keep nurses abreast with the times. Likewise subscriptions to nursing, health and industrial periodicals are also most helpful.

All industries should be interested in having at least a representative from their staff attend industrial nursing refresher courses, institutes, workshops and industrial nurses' conventions. The nurse attending such meetings benefits greatly and a well written report is also of benefit to the other staff members. Provision for leave of absence for educational purposes should be encouraged.

Industrial nurses could benefit from university extension courses such as courses in nutrition, mental hygiene and economics. Now that industry is accepting university public health nursing students for field work it is possible to presume that the universities will be most cooperative in furthering the cause of educating industrial nurses. For example, if industry supplied the speakers the university might sponsor an institute for industrial nurses.

Industrial nurses in the same area should be encouraged to meet and discuss their problems. These meetings can be informal and unorganized or can be organized through the provincial Registered Nurses Association.

In setting up a staff education program for industrial nurses one is always aware that such a program must meet the needs of the participants. The staff education program should be drawn up by the nursing supervisor and must have the approval of the medical director. Generally speaking industrial nurses need an increase in medical knowledge which can be achieved by guiding the nurses to read current medical literature. Readings could be assigned and interesting summaries and reports could be read and discussed at regular staff education meetings. Lectures by specialists are always stimulating to the industrial nurses and can be introduced from time to time, but active participation by the industrial nurses themselves is a more fruitful type of education.

The research approach towards health problems must be continually fostered. Examination of the findings of the medical records can show industrial nurses the effectiveness of their program and also where more time and health education must be allocated. All innovations in the medical department should be properly introduced and discussed.

The content of the health education program itself must be considered in staff education in order that the nurses will be teaching up-to-date, authentic and valid material. It is also important that all nurses within the same industry should teach the same material and use the same audio visual aides.

Diagnostic screening is a very important phase in the industrial nurse's work. She must be given all

possible instruction and the necessary practical demonstrations before she is capable of assuming such responsibility.

Frequently the industrial nurse feels inadequate in interviewing and counselling which are two of her very important functions. It would be appropriate to include in the staff education program means and measures to improve these techniques. The personnel department could doubtless contribute towards this phase of the program. Demonstrations of well conducted interviews by experienced personnel interviewers would help considerably.

Trends in labor relations and industrial relations are also topics which could be incorporated into an industrial nursing staff education program.

I have tried to give you some tangible suggestions regarding *Training the Industrial Nurse Within Industry or On the Job Training*. I have elaborated on the necessity, benefits and content of an induction and orientation program as well as a staff education program. In conclusion I wish to emphasize that adequate induction is industry's most economical way of producing an efficient industrial nurse and only by continuous staff education can this efficiency be maintained.

The Diabetic in Industry

By **Alan F. Fowler, M.D.**
Department of Metabolism and Toxicology
The Montreal General Hospital, Montreal, Quebec

Mr. Chairman and gentlemen, I have been asked to discuss with you the problem of 'The Diabetic in Industry'. I wish to thank you for this opportunity for two reasons. In the first place I am interested in the treatment of diabetics, in their welfare and their problems from the standpoint of the individual and secondly I am interested in the broader aspects of the role the diabetic must play in the community. A very important factor both to the individual and to the community is the problem of employment.

I realize that nothing constructive can be accomplished by merely asking that jobs be given to diabetics unless we are candid about the whole subject. We must admit their handicaps and limitations and at the same time we must not minimize their capabilities as has been done in the past. I am anxious they be given employment. I know that they are good employees, are honest with their employers and by their work can convince the employers of labor that the diabetic is employable and that the ideas of a quarter of a century ago do not apply today. I feel that the time has arrived when we must realize that because an individual has diabetes it does not constitute sufficient justification for refusing employment to him in a great many industries and in most companies.

The problems of the diabetic may affect a large section of the community. Diabetes is a fairly common disease. In the United States it is estimated that there are 1,000,000 known diabetics. Another 1,000,000 have it and are undiagnosed. It has been estimated that 4,000,000 people now living in the United States have diabetes or will develop it before they die. It is obvious that from the standpoint of the community the question of employment for diabetics is important and that it directly or indirectly affects a great many people.

The diabetic should not be forced to become a problem in social medicine. He is employable and should not be prevented from gaining employment by arbitrary company rulings. The diabetic does not ask the government for special diets or for free insulin. He does not require special sanatoria or isolation hospitals nor does he require the services of government subsidized clinics such as the cancer, tuberculosis or venereal disease clinics. All he requires is the right to obtain employment.

The ability of a diabetic to gain employment has narrowed markedly in recent years and unfortunately this has occurred at a time when, if given the opportunity, he could demonstrate that in the right job he is as good or better than the average employee.

There are a number of factors concerned in the problem of employment. In the first place the medical examiner for a company may refuse to accept a diabetic for employment. In some cases this is a definite company ruling. In others it is at the discretion of the doctor. This attitude has been influenced largely by the question of morbidity.

Recent statistics covering large groups of diabetics in industry are not available to present concrete data as to morbidity rates, loss of time, etc. Certainly the impressions of 10 or 20 years ago should not be the criteria on which employability is based. Today with better diets, improved nutrition, advances in insulin

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therapy, the use of antibiotics and the sulfa drugs, the life of the diabetic has changed appreciably.

The changes in morbidity rates have altered throughout industry in general. One would not use data collected 20 years ago in describing present conditions and I do not see why the diabetic should not be judged on his present performance. This is a field which could be explored in many corporations. In a recent survey the Bell Telephone Company of Pennsylvania reports that the time lost by their diabetic employees was no greater than that of the average employee. We must obtain more data.

There is another factor which must be considered and that is the question of suitable employment. Here we must distinguish between the diabetic who can be controlled on diet alone and the diabetic who in addition to his diet requires insulin. It is the latter group that constitutes the main problem. One must realize that a diabetic who takes insulin may as a result of increased work or failure to have meals on time develop hypoglycaemia. If he does have an insulin reaction his judgment may be impaired, he may not realize that he is having a reaction and he may not be able to make simple decisions quickly. That being the case it is important that these individuals should not be employed in occupations where their conduct might be a hazard to themselves or affect the welfare of other employees or result in damage to the machine or equipment with which they are working.

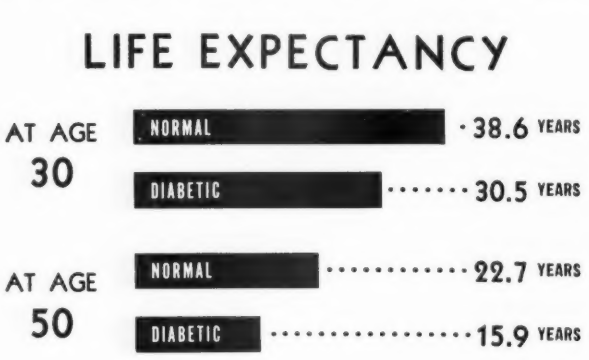
The diabetic taking insulin should not be employed on unprotected machines. He should not work at heights, drive airplanes, busses, or locomotives, etc. However there are many occupations that a diabetic can work at and it is important to all concerned that the job is a suitable one. It is here that the company doctor and the personnel manager can accomplish a great deal in a constructive manner.

The remarks that I have made largely concern an individual seeking employment. There is an even larger problem and that is the individual who develops diabetes while in the employ of a company. Diabetes is largely a disease of middle life. We find, for example, that while only a quarter of the population is 45 years or older, this age group has over half the diabetics. With the increasing population over age 45, we will have an increased incidence of diabetes in the future. The companies must face this problem in all sincerity to protect their own interests. If they do not they are exposing themselves to the actions of some dishonest diabetic who is continuing to work in a position that is not suitable to him. One shudders at such stories as that of the commercial airplane pilot who was taking insulin but always carried a couple of lumps of sugar in his pocket just in case he had a reaction, or the somewhat similar story of the driver of the school bus. On the other hand I have seen the opposite to this and have known engineers whose diabetic condition gradually deteriorated but they refused to take insulin because they realized they would have to stop driving the engine. Another stated that he would have to retire and that his early retirement would greatly reduce his pension. Problems such as these are fundamental and concern the individual's livelihood and all that is dependent on it. If the question is not faced squarely by the companies they should not be surprised at some dishonesty in their employees. And I would caution you that some diabetics taking insulin can fool some of the doctors some of the time. In this connection there is another point which we should all bear in mind and that is the fact that any individual in the personnel of a company might develop diabetes. It does not constitute much of a problem for the men in executive positions. They don't have to resign from a board of management or stop being directors when they develop diabetes. They are retained in what is considered to be suitable employment. This same attitude should be extended to cover the diabetics in their employ.

I realize that shifting a man from one position to another involves a great many factors. There are the problems of ability to change the type of work, availability of a position, seniority rights, complicated union regulations and pensions. In spite of all this there must be a rational approach to the problem and it is capable of solution. It will never be solved by unfairness to

the employee. The average diabetic is a pretty good citizen. His alcohol consumption is less than the average so that absenteeism on this account is most unusual. He is less likely to have syphilis or gonorrhea. His intelligence is as good as the non-diabetic. A diabetic whom you employ or retain in your employment will be a good worker, conscientious and dependable becauses he realizes his position and knows he must compensate for the sub-standard classification that has been the lot of the diabetic. He realizes that he must deliver his services to the best of his ability.

There is another problem that must be considered and that is the life expectancy of diabetics. We have seen the marked increase in the life expectancy at birth of the population as a whole. In 1900 it was 48.2 years for males and 51.8 for females. In 1947 it had increased to 65.2 years for males and 70.6 for females. Similarly the diabetics as a group have increased their average life expectancy and now it is three quarters of the expectancy of life for the population as a whole and it is steadily increasing. A normal individual at age 30 has a life expectancy of 38.6 years whereas a diabetic is expected, on the average, to live 30.5 years. At age 50 the normal expectancy is 22.7 years, compared with 15.9 years for the diabetic.



The overall picture of life expectancy for the diabetic is influenced by two factors. The first is the age at onset of the diabetes and the second is the duration of the diabetes. There is an increased risk associated with increase in duration. For example a diabetic of age 40 having had the disease for 20 years would have an increased risk compared with the individual of age 40 who had just developed the disease. One must consider these problems. These differences do exist but the gap is being narrowed steadily. The point I wish to make is that the average diabetic is expected to live through the generally accepted period of employment and to reach such an age that he would qualify for most pension schemes. The Metropolitan Life Insurance Company recently reported that the death rate for diabetics in their industrial policy holders in 1948 was 30% under the maximum recorded in 1940. This is a very creditable showing for a group who have been given sub-standard classification when it comes to employment. The picture is changing for the diabetic. He is now able to obtain life insurance. He should be given employment. We must obtain more data to show that the diabetic is a satisfactory employee and I feel that many of you gentlemen could investigate such a problem in your own companies.

In the right position a diabetic will acquit himself well. If the diabetic has better qualifications than the non-diabetic he should be given the job and not debarred from employment. The deciding factor should not be how severe the diabetes is but the care with which treatment is followed. This is what constitutes a good diabetic and it is the same factor which will make him a good employee.

Gentlemen, I feel that the diabetic is employable and should be given suitable employment. I would like to bring my remarks to a close with a quotation from Joslin who made the following statement: "I admire the backbone and brains of the average diabetic and I truly believe, on the whole, they are superior to the common run of people and therefore their good qualities merit cultivation."

The Use of BAL IN HEAVY METAL POISONING

By H. N. MacFarland, M.A., Ph.D.
Lecturer in Industrial Hygiene
Department of Physiological Hygiene
University of Toronto

In the past, clinical procedures employed for the treatment of the various heavy metal intoxications occurring in industry have been symptomatic and palliative in nature. While the need for specific antidotes has long been recognized, lack of adequate fundamental knowledge has prevented the development of therapeutic procedures based on rational rather than empirical grounds. The discovery that certain organic sulphur compounds, the monothiols, can reverse to some extent the toxic effects of arsenicals on micro-organisms (1) led to trial of such compounds as cysteine and glutathione in the clinical treatment of arsenic poisoning (2). However, the degree of success obtained with these methods was not as great as could be desired. Early in World War II a group working under the direction of R. A. Peters at Oxford University was chosen by the Chemical Defence Research Department of the Ministry of Supply to seek antidotes for the arsenical gases which might be used as a weapon by the enemy (3).

The Discovery of BAL

Stocken and Thompson of Peter's group investigated the reactions of certain proteins with lewisite (beta-chlorovinyl-dichlorarsine), a vesicant gas (4). On the basis of the quantitative chemistry of the reactions studied it was concluded that the arsenic in lewisite damaged the living organism through its ability to combine with essential thiol groups of cellular components. Furthermore these investigators found that each molecule of arsenic reacted with two thiol groups, both of which were probably associated with the same protein molecule. They reasoned that a dithiol rather than a monothiol might be more effective in reversing the damaging alterations caused by lewisite. Early in the experimental examination of this hypothesis the dithiol 2, 3-dimercaptopropanol was tested and in 1940 Stocken and Thompson discovered that rats could be adequately protected from the lethal action of lewisite by administration of this compound (5). American investigators later named the dithiol British Anti-Lewisite and to-day it is generally known by the abbreviation BAL. In subsequent studies the ability of BAL to counteract the toxic effects of lewisite and other arsenicals has been fully established.

The Properties of BAL

Pure BAL is a colorless, oily liquid possessing a garlic-like odor. The pure compound is quite toxic and it is always employed in solution for clinical purposes. Peanut oil containing benzyl benzoate has been found to be a suitable solvent for BAL when the compound is administered intramuscularly (6). Preparations in the form of salves or ointments have been used for the treatment of skin and eye damage from arsenicals (7). The quantities of BAL which are effective against arsenic poisoning yet not of themselves unduly toxic have been determined and a rational dosage schedule has been drawn up based on this data (8).

It has been shown in animal experiments that large doses of BAL cause a peripheral vasoconstriction and an increase in capillary permeability (9). In man, full therapeutic dosage of BAL may produce various side-effects likely related to these pharmacodynamic actions. Elevation of systolic and diastolic blood pressures and tachycardia have been observed clinically (10). Preparation of the patient by oral administration of ephedrine sulphate prevents these undesirable side-effects (11).

The metabolic fate of BAL has been investigated in animals and the use of BAL containing radio-active sulphur has facilitated these studies (12). It has been

shown that BAL is not fixed preferentially in any organ and undergoes rapid elimination in the urine (13). The exact chemical nature of the urinary thiol is not known; the end-product is similar to but not identical with BAL itself (14).

The Use of BAL in Heavy Metal Poisoning

(a) Experimental Investigations

In the early work of Stocken and Thompson, rats were protected from the effects of lewisite by the administration of BAL. Poisoning by mapharsen, one of the newer anti-syphilitic arsenicals, has been successfully treated with BAL in rats, guinea pigs, cats and rabbits (15, 16, 17, 18). BAL has also been shown capable of counteracting Paris green poisoning in rabbits (19), and of reducing mortality in dogs which have been exposed to the vapors of lewisite or phenyldichlorarsine (20). The destructive action of lewisite vapor or liquid on the eye of the rabbit was described by Hughes (21). He showed that a single instillation of BAL within two to five minutes of application of the lewisite prevented the development of irreversible ocular lesions.

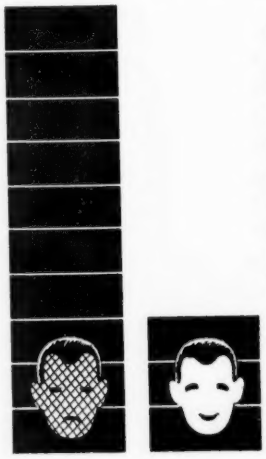
It was an understanding of the fundamental mode of action of arsenic on living tissues, that is its ability to combine with essential thiol groups of proteins that paved the way to the development of BAL. It is probable that the action of other metalloids and heavy metals is similar. This hypothesis finds support in the recent work of Barron and Kalnitsky (22). They found that an enzyme preparation known to depend for its activity on the presence of thiol groups was inhibited by not only arsenic compounds but also by salts of bismuth, cadmium, mercury, vanadium, zinc, lead and antimony. It was inevitable that the ability of BAL to counteract the toxic action of these and other metals should be investigated soon after the discovery of its value in arsenic intoxication. The metallic poisons studied are many and a variety of experimental techniques have been used. However, it is possible to evaluate and compare the results obtained, at least in a qualitative fashion. BAL appears to be useful in the treatment of intoxication by salts of arsenic, mercury, cadmium, gold, antimony, bismuth, copper, nickel and tungsten. However, the experimental studies would contra-indicate the use of BAL in poisoning by compounds of lead, uranium, silver, cobalt, selenium and iron. Results are also available on the use of BAL in experimental chromium, thallium and thorium poisoning but there is insufficient data on which to base any conclusion.

(b) Clinical Applications

The favorable response to BAL therapy in certain experimental heavy metal intoxications has found application in the clinical treatment of a few types of metal poisoning. Data are now available on the use of BAL in arsenic, mercury, gold, lead, antimony and tellurium intoxications and the results are summarized below.

Arsenic

BAL was first employed clinically in the treatment of patients exhibiting signs of intoxication following intensive anti-syphilitic arsenotherapy. Later reports have also been mainly concerned with this type of case.



A frequently seen complication of arsenotherapy is acute exfoliative dermatitis. BAL reduces the time taken to clear the skin in this condition from eight to ten to approximately three weeks (23). Eagle reported an even shorter average recovery period of 13 days (8, 24). In addition, this author observed the response to BAL of some of the less frequently encountered manifestations of arsenic intoxication. Toxic encephalopathy or "hemorrhagic encephalitis" responded well to BAL therapy and it has been concluded that mortality from this condition could probably be reduced to 15% by early administration of the dithiol. Favorable results have also been obtained in the treatment of blood dyscrasias, post-arsenical jaundice and "arsenical fever". However, aplastic anemia from arsenicals has not been found to respond to BAL therapy.

Some information is available on the efficacy of BAL in the treatment of arsenic poisoning following exposure to the more toxic compounds of this element. Intractable dermatitis due to exposure to diphenylamine chlorarsine dust has been successfully treated with BAL (25). The administration of BAL was found to markedly increase the rate of excretion of arsenic in volunteers exposed to low concentrations of diphenylcyanoarsine smoke (26). The decontamination of human skin exposed to lewisite was studied by Thompson and co-workers in an extensive investigation; they found BAL to be the most effective of a series of dithiols tested for this purpose (27).

There can be no doubt that the object of the original investigations of Peters' group — to find an antidote for arsenic intoxication — has been successfully attained with the discovery of BAL. A crucial test of the efficacy of BAL is reported by Eagle and Magnuson (24). Four cases were studied in which massive overdoses of mapharsen had been administered accidentally. Three of these recovered rapidly on treatment with BAL: the authors concluded that the death of the fourth was a result of inadequate BAL therapy.

Mercury

Experimental studies on the use of BAL in animals poisoned with various compounds of mercury indicated that the dithiol was useful in this type of intoxication. In the United States, cases of attempted suicide by swallowing mercuric chloride (corrosive sublimate) furnished opportunities for the first clinical trials of BAL in mercury poisoning.

To-day, the use of BAL in over 50 cases of mercury poisoning has been reported. The series of Longcope and Luetscher comprised 42 patients who had ingested mercuric chloride in amounts ranging from 0.5 to 20 grams (28). The need for prompt administration of BAL was stressed by the authors. Of 24 cases in which one gram or more of the mercury salt had been taken and who received BAL within four hours of the incident, none died. In a comparable group of 86 patients not given BAL, 27 deaths occurred. BAL has also been found to produce rapid recovery from acrodynia and other erythematous manifestations of mercury intoxication, sometimes seen in children given calomel (mercurous chloride), or grey powder (chalk with mercury) (29, 30).

Gold

Reports on the use of BAL in experimental gold intoxication have been somewhat contradictory but the major part of the evidence indicates that the dithiol is capable of reversing to some extent the toxic effects of gold on living organisms. The dermatitides that arise occasionally after chrysotherapy for rheumatoid arthritis frequently limit this type of treatment. It has been found that BAL controls this condition in man (31, 32). In some cases a return of the arthritic symptoms after BAL therapy has been observed (33); in others, dermatitis has been successfully treated without recurrence of arthritis (34).

Lead

Experimental investigations of the use of BAL in the treatment of lead poisoning have yielded conflicting results. However, animal experiments indicate that BAL is not useful in this form of heavy metal intoxication. Few reports are available describing the clinical treatment of lead poisoning with BAL. Ryder's group, after treatment of some 30 cases of industrial plumbism, concluded that BAL was of no value in the therapy of poisoning from inorganic lead compounds (35). They were unable to shorten consistently the clinical course of lead intoxication, to maintain significantly increased rates of elimination of the metal or to reduce the period of occupational disability (36).

Antimony

BAL has been found to be useful in the treatment of experimental antimony poisoning and one clinical report is available on the therapeutic use of BAL in five cases of such intoxication. These patients exhibited toxic reactions after the administration of therapeutic antimonials for the treatment of schistosomiasis and filariasis (37). It was found that BAL was of value in treating the toxic manifestations which consisted of skin eruptions, cardiovascular involvement, hepatic and renal insufficiency and neuritis.

Tellurium

While experimental study of the use of BAL in tellurium intoxication has not been reported, Amdur presented a series of three cases of accidental industrial exposure to tellurium fumes which were treated with BAL (38). The offensive, garlic-like odor of the breath which follows absorption of tellurium compounds was found to disappear after only two weeks when BAL was administered.

Conclusion

An attempt has been made in this review to outline the development of BAL and to indicate the dependence of this discovery on a knowledge of the fundamental action of heavy metals on living systems. It affords an excellent example of a contribution to therapeutic practice resulting from basic biochemical research.

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